



LEVEL ~~02~~

THE **BDM**  
CORPORATION

AD A096599

DTIC  
SELECTED  
MAR 20 1981  
S D A

This document has been approved  
for public release and sale; its  
distribution is unlimited.

THIS DOCUMENT IS BEST QUALITY IT IS  
THE COPY FURNISHED TO DDC CONTAINED A  
SIGNIFICANT NUMBER OF PAGES WHICH DO NOT  
REPRODUCE LEGIBLY.

DoD FILE COPY

81 2 23 011

## **DISCLAIMER NOTICE**

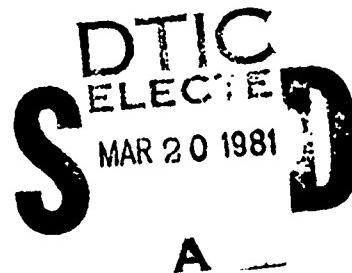
**THIS DOCUMENT IS BEST QUALITY  
PRACTICABLE. THE COPY FURNISHED  
TO DTIC CONTAINED A SIGNIFICANT  
NUMBER OF PAGES WHICH DO NOT  
REPRODUCE LEGIBLY.**



P. O. Box 2019  
2600 Garden Rd.  
Monterey, California 93940  
Phone (408) 649-3880

15 JANUARY 1981

BDM/M-TR-0001-81



This document has been approved  
for public release and sale; its  
distribution is unlimited.

"AEROSOL EXTINCTION OVER THE OCEAN:  
A FIELD EVALUATION OF THE  
WELLS - MUNN - KATZ MODEL"

by  
CHRISTOPHER W. FAIRALL  
Project Engineer

(12) 83

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
14 REPORT NUMBER BDM/M-TR-0001-81	15 2. GOVT ACCESSION NO. AD-A096599	3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and subtitle) AEROSOL EXTINCTION OVER THE OCEAN: A FIELD EVALUATION OF THE WELLS - MUNN - KATZ MODEL		5. TYPE OF REPORT & PERIOD COVERED Technical <del>1980</del> rept.	
6. AUTHOR(s) Christopher W. Fairall Project Manager		7. PERFORMING ORG. REPORT NUMBER BDM/M-TR-0001-81	
8. PERFORMING ORGANIZATION NAME AND ADDRESS The BDM Corporation 2600 Garden Road Monterey, CA 93950		9. CONTRACT OR GRANT NUMBER(S) N00014-78-C-0204	
10. CONTROLLING OFFICE NAME AND ADDRESS Dean of Research Code 012 Naval Post Graduate School Monterey, CA 93940		11. PROGRAM-ELEMENT-PROJECT, TASK AREA & WORK UNIT NUMBERS 086432	
12. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Mr. Robin Simpson Administrative Contracting Officer Office of Naval Research Resident Representation Stanford University, Room 165		13. REPORT DATE 15 January 1981	
14. DISTRIBUTION STATEMENT (for this Report) Stanford, CA 94305		15. NUMBER OF PAGES 88	
		16. SECURITY CLASS. (of this report) UNCLASSIFIED	
		16a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
17. DISTRIBUTION STATEMENT (for the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)			
Page viii		410162	

THE BDM CORPORATION

FOREWORD

This report was prepared under Work Order No. 086432 of Contract No. N00014-78-204 in support of the U.S. Naval Postgraduate School research project supported by the Naval Air Systems Command (AIR 370) and the Naval Material Command (EO/MET). The data were obtained by the Environmental Physics Group at NPS under the direction of Professors K. L. Davidson and G. E. Schacher.

Accession For	
NTIS	GRA&I
DTIC	TAB
Unannounced	
Justification <i>little profile</i>	
By _____	
Distribution/ _____	
Availability Codes	
Avail and/or	
Dist	Special
A	23
	CP

# THE BDM CORPORATION

## TABLE OF CONTENTS

	<u>PAGE</u>
FOREWORD	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	v
LIST OF TABLES	vii
ABSTRACT	viii
A. INTRODUCTION	1
B. MEASUREMENTS	1
1. Aerosols	1
2. Meteorology	1
C. ANALYSIS	5
1. Aerosol Spectra	5
2. Model Calculations	5
3. Volume Representation	6
4. Editing	7
D. RESULTS	8
1. Model Extinction Comparison	8
2. Model Volume Spectrum Comparison	13
E. DISCUSSION	19
APPENDICES	23
A. JASIN Data	A-1
B. CEWCOM-78 Data	B-1
BIBLIOGRAPHY	24
INITIAL DISTRIBUTION LIST	26

THE BDM CORPORATION

LIST OF FIGURES

<u>FIGURE</u>		<u>PAGE</u>
1a	Location of CEWCOM-78 Experiment.	2
1b	Location of JASIN Experiment.	3
2	Measured Aerosol Extinction Coefficient, $\alpha$ , versus 12 Hour Average Wind Speed, $u$ , for JASIN	9
3	Measured Extinction Coefficient (Circles) and WMK Model Predictions at $\lambda = 10.6\mu\text{m}$ and RH = 87% versus Wind Speed.	
	a) JASIN (12 hour average $u$ ).	10
	b) CEWCOM-78 (circles - 12 hour average $u$ , X's - 20 minute average $u$ ).	11
4	Ratio of Measured Aerosol Extinction Coefficient at $\lambda = 0.49\mu\text{m}$ to those Measured at $\lambda = 3.75\mu\text{m}$ and $\lambda =$ $10.6\mu\text{m}$ versus Wind Speed.	12
5	WMK Model Predictions of $\lambda = 10.6\mu\text{m}$ Aerosol Extinction as a Function of Extinction Actually Observed (circles - B = 1.7, X's - B = 0.24, triangles - B taken from Fig 6).	14
6	Continental Aerosol Coefficient $A' = \frac{4}{3}\pi B$ versus Measured Extinction in the visible ( $\lambda = 0.49\mu\text{m}$ ).	15
7	Ensemble Average Aerosol Volume Spectra, $V(r)$ , versus Particle Radius at Various Wind Speeds. The Particles at $r = 0.1\mu\text{m}$ are Primarily of Continental Origin.	16
8	Atmospheric Radon Activity (Solid line) and Contracted Aerosol Coefficient (dashed line) During CEWCOM-78.	17
9	Aerosol Volume Spectral Density $dV/dr = V(r)$ versus Wind Speed at $r = 5.0\mu\text{m}$ . The Circles are the JASIN Data, the Dashed line is the WMK Model and the Solid Line is a Model from Fitzgerald and Ruskin (1975).	18

THE BDM CORPORATION

LIST OF FIGURES (Continued)

<u>FIGURE</u>	<u>PAGE</u>
10      Ratio of Aerosol Extinction Coefficient at $\lambda = 0.49\mu\text{m}$ to those at $\lambda = 3.75\mu\text{m}$ and $\lambda = 10.6\mu\text{m}$ (Circles - JASIN data, dashed line - WMK Model with $B = 0.24$ , dotted line - WMK Model with $B = 1.7$ ) versus Wind Speed.	20
11      Fractional Change of Aerosol Extinction Coefficient (Circled X - Visible, Circles - IR) Versus Changes in Mixed Layer Height, h. The Data is for Successive Four Hour Average Periods from May 19-20 of CEWCOM-78.	22

THE BDM CORPORATION

LIST OF TABLES

<u>TABLE</u>		<u>PAGE</u>
I	Summary of Meteorological Instrumentation	4

ABSTRACT

Aerosol and Meteorological data from cruises in the East Pacific (CEWCOM-78) and the North Atlantic (JASIN) were used to evaluate the predictive performance of the Wells-Munn-Katz aerosol model. Under given meteorological conditions (wind speed and relative humidity), the model gave very good predictions of the average aerosol extinction coefficient at  $10.6\mu\text{m}$  wavelength (the standard deviation was about a factor of three). The model did not perform well when asked to predict specific aerosol extinction values. The model continental coefficient,  $B = 1.7$ , was found to be too large; the average open ocean value should be  $B = 0.24$ . The continental coefficient was found to be important for predicting IR band extinction from visible band extinction estimates. Further analysis demonstrated that much of the variance of continental aerosol spectral density was due to air-mass history and that much of the variance of sea salt aerosol spectral density was due to changes in the marine layer mixing height.

# THE BDM CORPORATION

## A. INTRODUCTION

Aerosol size spectrum data from two oceanic field experiments have been used to evaluate the Wells-Munn-Katz (WMK) marine aerosol Model B (Noonkester, 1980). The field experiments were the Cooperative Experiment for West Coast Oceanography and Meteorology (CEWCOM-78) off the California coast in May, 1978 and the Joint Air-Sea Interaction (JASIN) experiment between Scotland and Iceland in August and September, 1979 (see Figure 1). The purpose of this report is to evaluate the accuracy of WMK predictions of aerosol extinction coefficient,  $\alpha$ , and to produce modifications, if possible, that improve the model.

## B. MEASUREMENTS

### 1. Aerosols

The aerosol size spectra were compiled using Particle Measurements Systems, Inc., (PMS) optical spectrometers. The smaller sizes (0.075 to  $1.5\mu\text{m}$  radius) were counted with a PMS model ASAS-100 (active scattering) probe; the larger sizes (0.2 to  $14\mu\text{m}$  radius) were counted with a PMS Model CSAS-300 HV (classical scattering) probe. The spectrometer probes were controlled by a PMS Model DAS-32 data acquisition system with the data recorded on digital magnetic tape. Further details on the aerosol system can be found in Schacher et al (1980).

### 2. Meteorology

The meteorological parameters of direct relevance to the WMK model are relative humidity ( $H$ ) and true wind speed ( $u$ ). In addition, we obtained measurements of air temperature ( $T$ ), sea surface temperature ( $T_s$ ), relative wind speed ( $U_r$ ) and direction ( $\phi$ ), ship speed ( $U_s$ ), and mixed layer height ( $h$ ). A complete description of the equipment is given in Houlihan et al (1978). A summary is provided in Table I. Note that CEWCOM-78 had more accurate  $T$  and  $H$  measurement, and two complete levels of meteorological instrumentation. The ship's speed ( $U_s$ ) was taken from

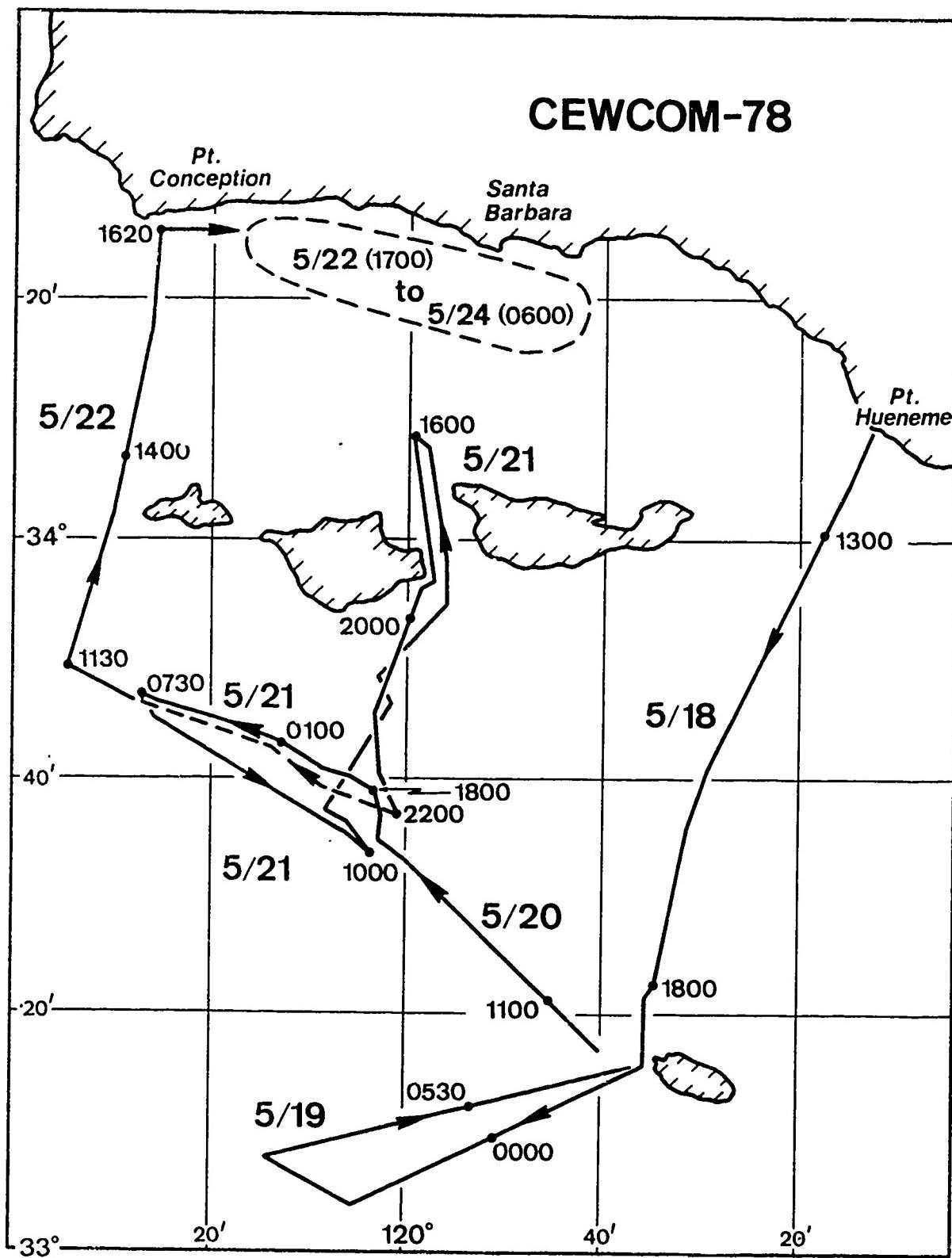


Figure 1a. Location of CEWCOM-78 Experiment.

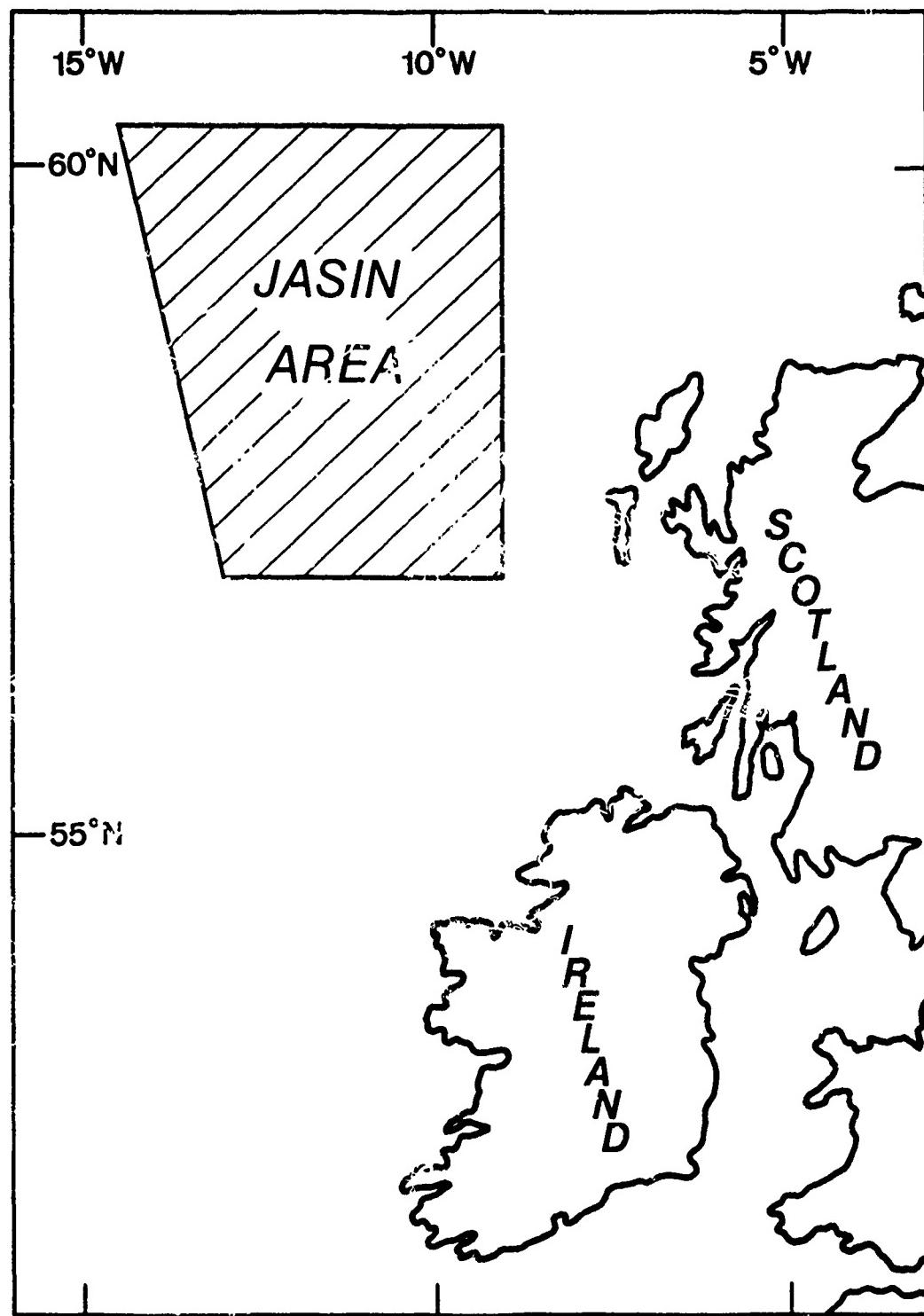


Figure 1b. Location of JASIN Experiment.

THE BDM CORPORATION

TABLE I. Summary of meteorological instrumentation.  
 The numbers below the instrument description  
 are estimates of the measurement accuracy  
 of the corresponding meteorological parameter.

Experiment	$U_r$	H	T	$T_s$	h	Level Met.	Height Aerosol
CEWCOM-78	Cup	LiCl	Quartz	Quartz	Acoustic	7,20 m	10 m
	0.5 m/s	3%	0.20C	0.50C	30 m	-	-
JASIN	Cup	LiCl	Therm.	Therm.	None	14 m	14 m
	0.5 m/s	5%	0.50C	0.50C			

# THE BDM CORPORATION

a shipboard instrument during JASIN but was simply "eyeball" estimated by the captain for CEWCOM-78. Thus, the true wind data are more accurate for JASIN.

## C. ANALYSIS

### 1. Aerosol Spectra

The basic aerosol data is obtained as  $N(r) = dN/dr$  in 90 size channels (6 ranges of 15 channels each) from  $0.075$  to  $14\mu\text{m}$  radius. The  $N(r)$  spectrum is calculated for successive 20 minute averaging periods. The first few size bins of each range are thrown out because they are influenced by noise and bias errors in the photodetector. Other bins in the  $0.5$  to  $2\mu\text{m}$  radius area are thrown out because they fall in the "ambiguity zones" associated with non-single valued nature of the light scattering at the  $0.63\mu\text{m}$  laser wavelength of the spectrometers.

The  $N(r)$  spectrum is fit in LGT ( $N(r)$ ), LGT( $r$ ) space with a seventh order polynomial for  $0.1 < r < 7\mu\text{m}$  and a first order polynomial (linear) for  $r > 7\mu\text{m}$ . The linear fit (in log-log space) is used for the larger sizes to avoid the instabilities associated with extrapolating high order polynomials beyond regions of poor statistics. The extinction is calculated using

$$\alpha = \int_{0.03}^{30} \pi r^2 N(r) E(n, \lambda) dr \quad (1)$$

where  $E(n, \lambda)$  is the Mie scattering efficiency at wavelength  $\lambda$  and refractive index  $n$ . This entire process is described in great detail in Schacher et al (1980).

### 2. Model Calculations

We have used the WMK model B as given by Noonkester (1980). Since several WMK models are available, we will provide exact details here. The size spectrum is given by

THE BDM CORPORATION

$$N(r) = B(r/a)^{-4} + 1.62(C_1 + C_2 v^\delta)(e^{\frac{-Z}{h_0}} F^{-\Gamma}) \quad ) \frac{r}{Fa} \quad (2)$$

where  $r$  = radius,

$$v = 0.5 \text{ for } u \leq 4 \text{ m/s}$$

$$v = u - 3.5 \text{ for } u > 4 \text{ m/s}$$

$$F = 1 + (V/60)^3$$

$$\Gamma = 0.384 - 0.00293 V^{1.25}$$

$Z$  = height above sea surface, m

$h_0$  = scale height, m (800m for  $Z < 1000$ m)

$$B = 1.7$$

$$a = 0.81 \exp 0.066S/(1.058 - S)$$

$$S = H/100$$

The other constants are given below

$v$ , m/s	$C_1$	$C_2$	$\delta$
$v \leq 7$	350	1000	1.15
$v \geq 7$	0	6900	0.29

We have used the model in this form for the extinction calculating although it is theoretically wrong by a factor  $a^{-1}$  (see Wells et al, 1977, and Hughes, 1980). The first item in Eq. 2 is the continental aerosol component and has an  $r^{-4}$  dependence generally referred to as a "Junge" distribution. The second term, which is wind speed dependent, is the locally generated sea salt component.

### 3. Volume Representation

Since the size dependence of aerosol spectral density,  $N(r)$ , is typically on the order of  $r^{-3}$ , the volume spectrum is often more convenient to deal with.

$$V(r) = \frac{dV}{dr} = \frac{4}{3}\pi r^3 N(r) \quad (3)$$

Thus, we can partition the marine aerosol volume distribution into continental ( $V_C$ ) and sea salt ( $V_S$ ) components

# THE BDM CORPORATION

$$V(r) = V_c(r) + V_s(r) \quad (4)$$

where we assume

$$V_c(r) = A' a^3/r = A/r \quad (5)$$

The quantity  $A' = A/a^3 = \frac{4\pi}{3} B$  is called the normalized Junge coefficient (A is the unnormalized Junge coefficient).

## 4. Editing

There are 950 JASIN and 450 CEWCOM-78 aerosol spectra (20 minute averages). The criteria used to exclude data from the analysis are listed below

- 1) Relative wind direction not within  $30^\circ$  of aerosol probe intake axes.
- 2) Humidity and true wind speed data unavailable.
- 3) Fog events ( $\alpha > 1 \text{ km}^{-1}$ )
- 4) Continental influence: Certain time periods in CEWCOM-78 were heavily contaminated with continental aerosols due to proximity to land or off shore wind conditions.
- 5) Insufficient wind speed data over previous twelve hours:  
The true wind speed used in most of the WMK comparisons was an average of over the previous twelve hours. Previous investigations (Katz, 1980) have shown that the long time periods required for the aerosols to reach equilibrium with the local surface generation precludes the use of a simple 20 minute average wind speed. We excluded data if there was more than a three hour gap in the wind speed record over the previous twelve hours. This eliminated about 30% of the JASIN data and about 90% of the CEWCOM-78 data.

D. RESULTS

The results presented here will tend to emphasize the JASIN data. Because CEWCOM-78 was so close to the continent, the variations in background (continental) aerosols was considerable. This problem was accentuated by a cruise plan that brought the ship into the Los Angeles basin on several occasions. The periodic downwind cruise track of the ACANIA greatly reduced the amount of data available for the 12 hour wind speed averages.

One further note on terminology is in order. For the sake of simplicity, aerosol extinction coefficients calculated from the aerosol spectral density data (Section C-1) shall be referred to as the "measured" extinction. Those who feel that this is unbearably arrogant are referred to a recent report (Fairall et al, 1980) which documents the excellent correlation of optical measurements of extinction with NPS aerosol spectrum extinction calculations.

1. Model Extinction Comparison

The basic measurements of extinction at three relevant wavelengths are presented in Figure 2 to illustrate the strong wind speed dependence. In Figure 3 the data are compared with the WMK predictions for  $\lambda = 10.6 \mu\text{m}$  at RH = 87%. Because of the scarcity of CEWCOM-78 data, we also included the 20 minute wind speed average results. The JASIN data 12 hour averages were a much better fit to the WMK curve than the 20 minute averages and, in fact, were very similar to the CEWCOM-78 results. The ratio of the visible extinction to the IR extinction (a useful parameter because it is essentially independent of relative humidity) is shown in Figure 4 for 10.6 and  $3.75 \mu\text{m}$  wavelengths.

This comparison (Figure 3) asks "given a wind speed and relative humidity, how well does the model predict the observed extinction"? Clearly, the WMK model predicts very well on the average with rather large standard deviation (about half an order of magnitude, or a factor of 3). A considerably more stringent comparison asks "given an observed extinction, how well does the model predict this extinction"? This

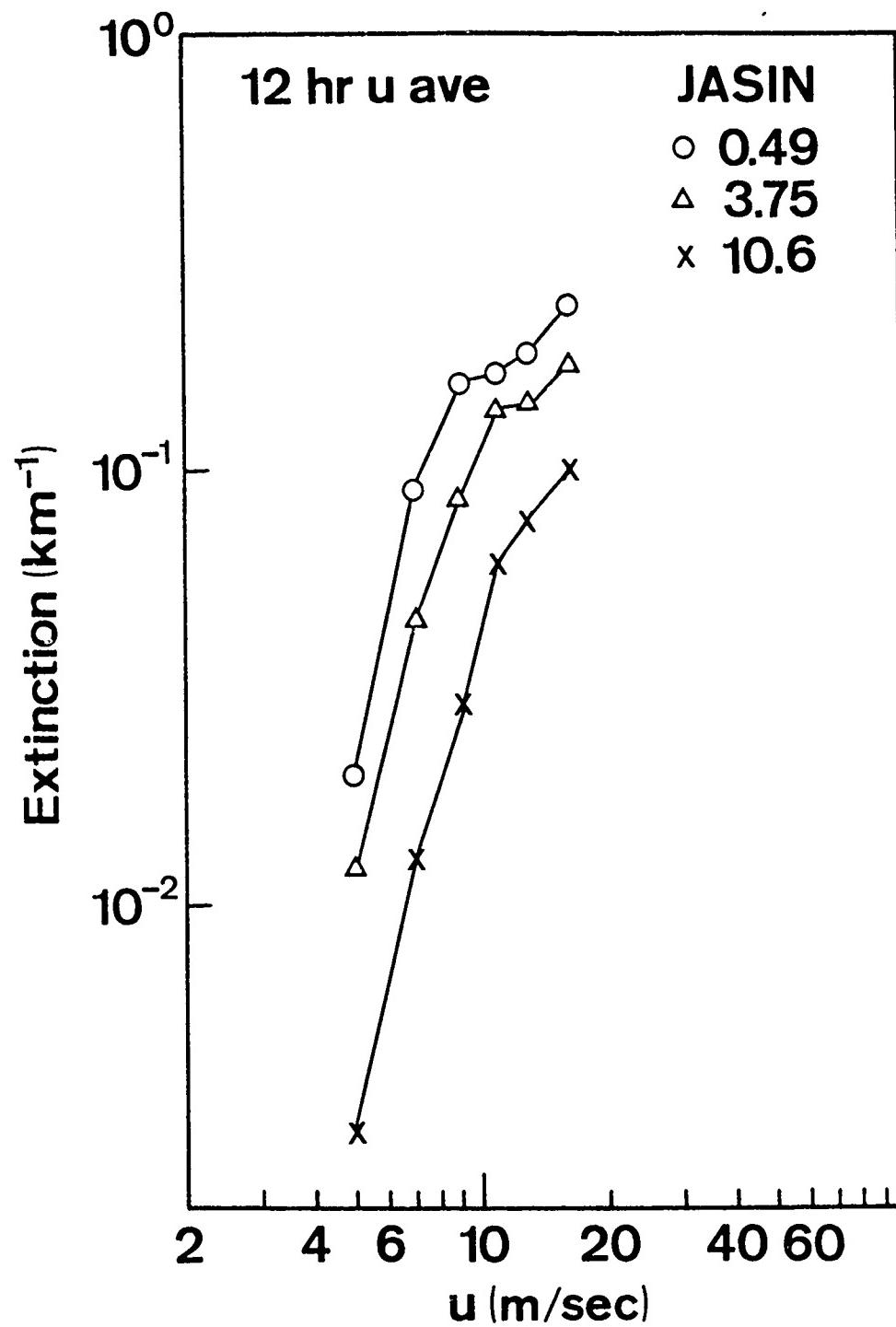


Figure 2. Measured Aerosol Extinction Coefficient,  $\alpha$ , Versus 12 Hour Average Wind Speed,  $u$ , for JASIN.

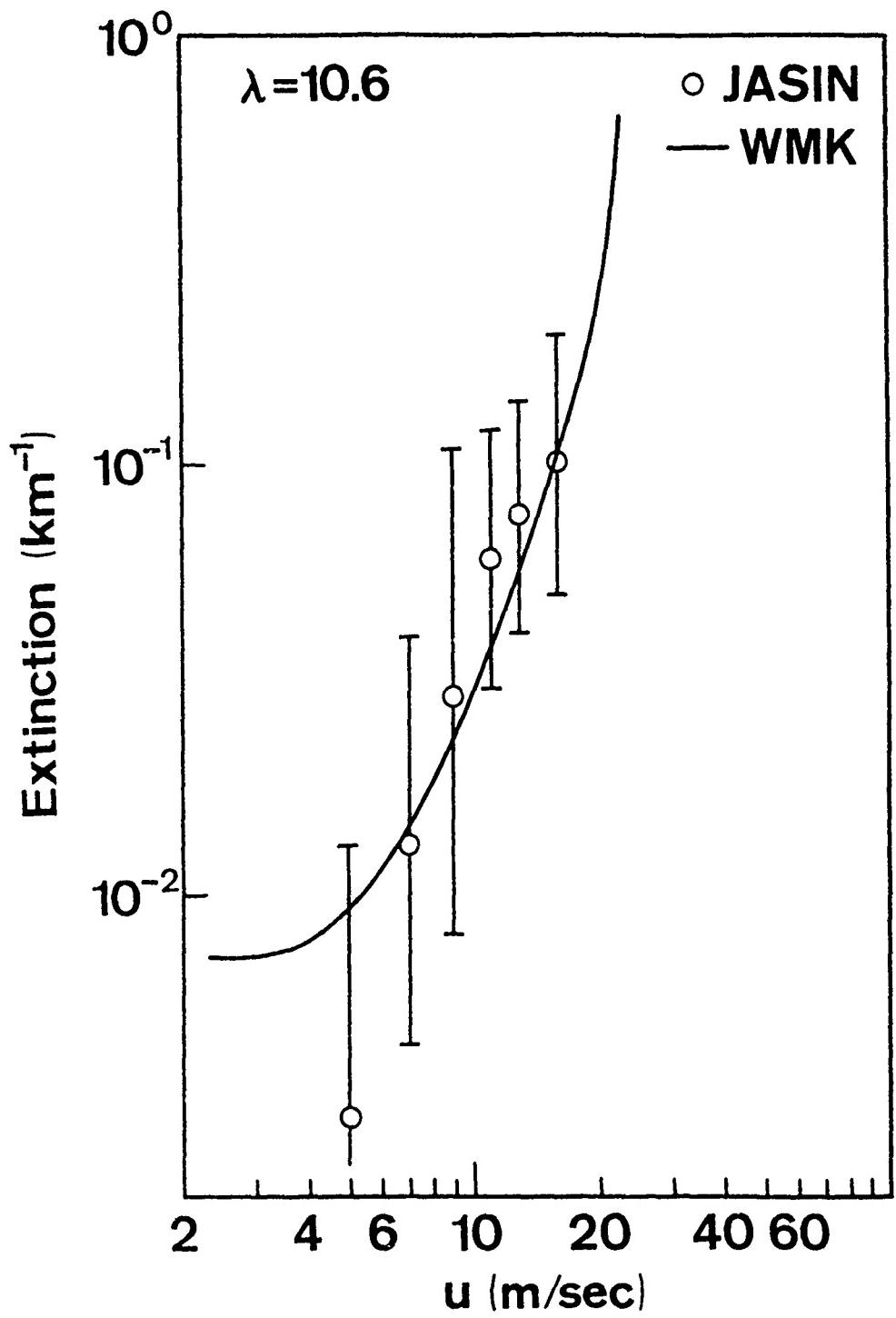


Figure 3a. Measured Extinction Coefficient (Circles) and WMK Model Predictions at  $\lambda = 10.6\mu\text{m}$  and RH = 87% Versus Wind Speed.  
 JASIN (12 Hour Average  $u$ ).

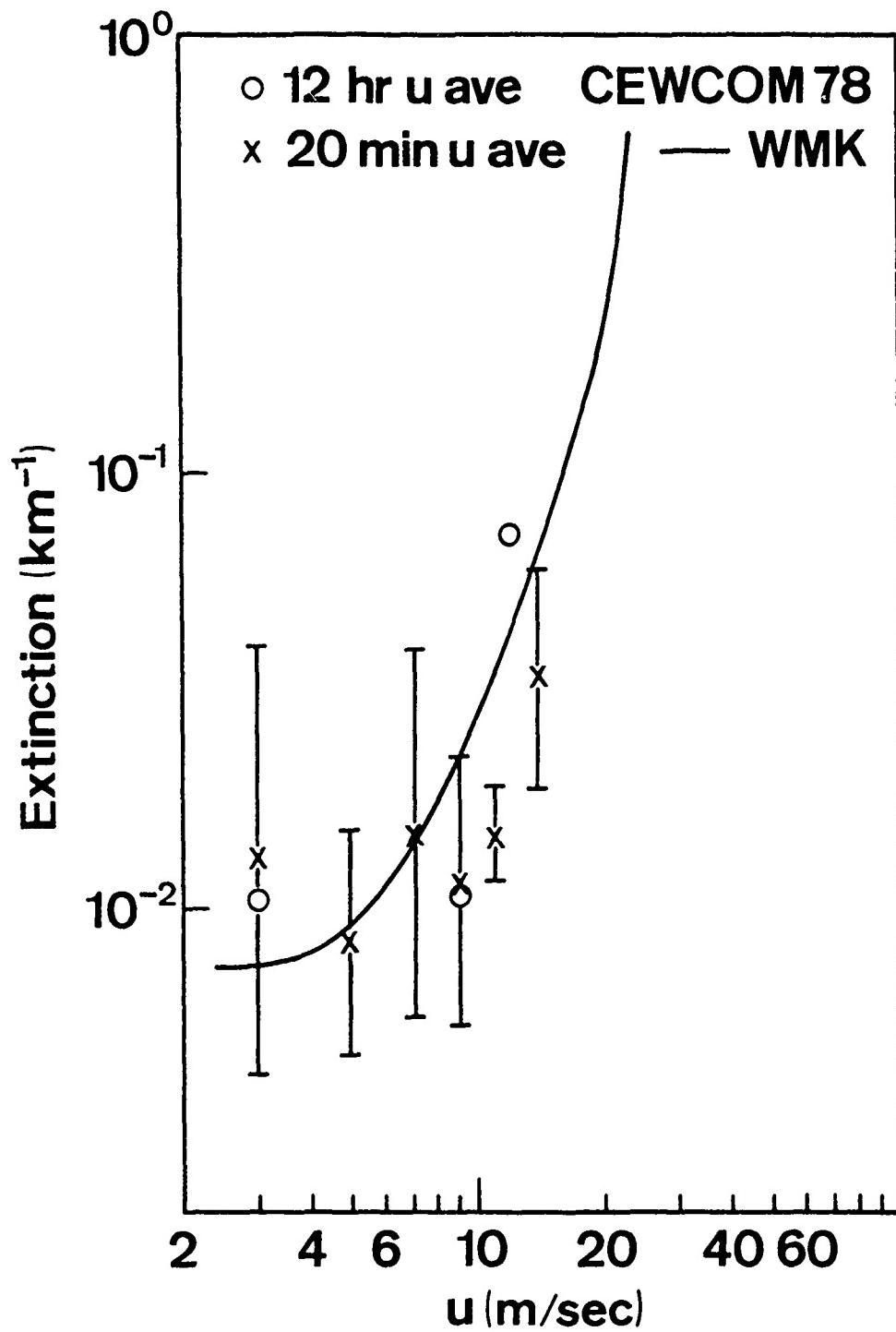


Figure 3b. Measured Extinction Coefficient (Circles) and WMK Model Predictions at  $\lambda = 10.6\mu\text{m}$  and RH = 87% Versus Wind Speed. CEWCOM-78 (Circles - 12 Hour Average  $u$ , X's - 20 Minute Average  $u$ ).

JASIN  
12 hr u ave  
RH = 87%

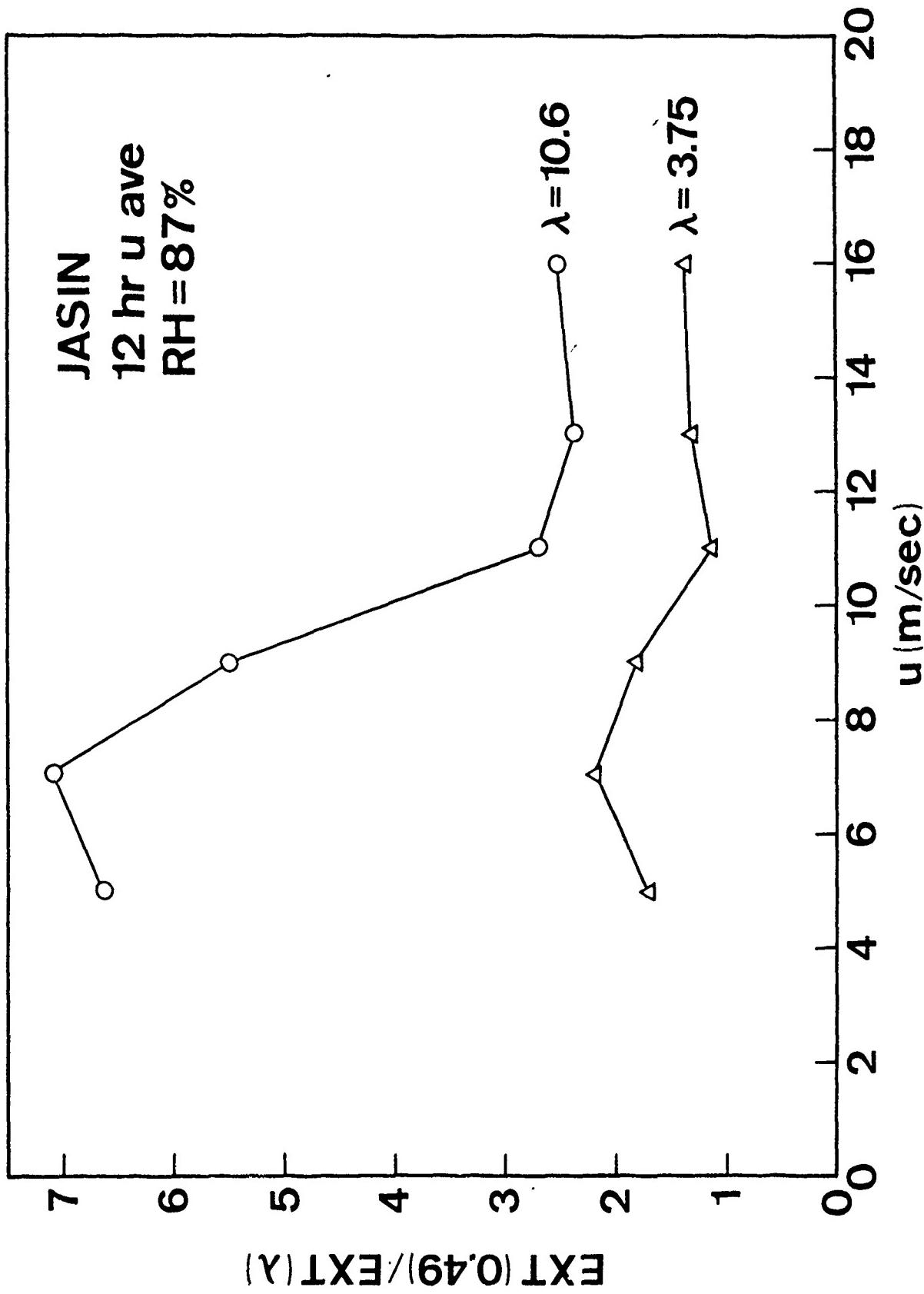


Figure 4. Ratio of Measured Aerosol Extinction Coefficient at  $\lambda = 0.49\mu\text{m}$  to those Measured at  $\lambda = 3.75\mu\text{m}$  and  $\lambda = 10.6\mu\text{m}$  Versus Wind Speed.

comparison (Figure 5) is considerably less favorable, particularly in the extremes of very clear and very unclear conditions. A certain amount of disagreement of this type is expected when comparing quantities that are subject to experimental error. However, we show in Figure 6 that a considerable part of the discrepancy is due to over estimation of the continental aerosol component (WMK assume  $B = 1.7$  or  $A' = 7.1$ ). Furthermore, the high visibility conditions are characterized by much smaller continental aerosol densities ( $A' = 0.2$ ) while the low visibility conditions have typically greater continental aerosol densities ( $A' = 1.7$ ). The disagreement at high extinction values is due to the inaccuracy of the relative humidity measurement which is critical under near fog and heavy haze conditions where  $RH \approx 100\%$ .

## 2. Model Aerosol Spectrum Comparison

Since the extinction results of the previous section revealed some problems with the WMK model, we decided to use the aerosol spectrum volume density,  $V(r)$ , to examine the model more fundamentally. The total conglomerate volume spectra for JASIN are shown for different 12 hour wind speed categories in Fig. 7. This graph clearly indicates that  $V(r)$  is virtually independent of wind speed at  $r = 0.1\mu\text{m}$ . We conclude that surface generated sea salt aerosols are insignificant at  $r = 0.1\mu\text{m}$  and that these particles are of non-local (continental background) origin. Therefore, by keying on the  $V(r)$  spectrum for  $r < 0.3\mu\text{m}$ , we can simply calculate the continental coefficient from the observed spectrum using Eq. 5 ( $A = rV(r)$ ). This method was used to obtain the values of  $A'$  given in Fig. 6. Further proof that this gives a realistic index of continental influence is given in Fig 8 where  $A'$  (recall that  $A'$  is  $A$  corrected for relative humidity) is compared to atmospheric radon activity for CEWCOM-78 (Larson et al, 1979).

A typical value of  $A'$  was 1.0 for JASIN with a range from .1 to 5. For CEWCOM-78 (excluding several periods directly off the coast),  $A'$  was typically 2.0 with a range from 1 to 10. If we simply change the continental coefficient from  $A' = 7.1$  ( $B = 1.7$ ) to  $A' = 1$  ( $B = 0.24$ ), the WMK model predictions are improved in the clearer conditions: (X's in

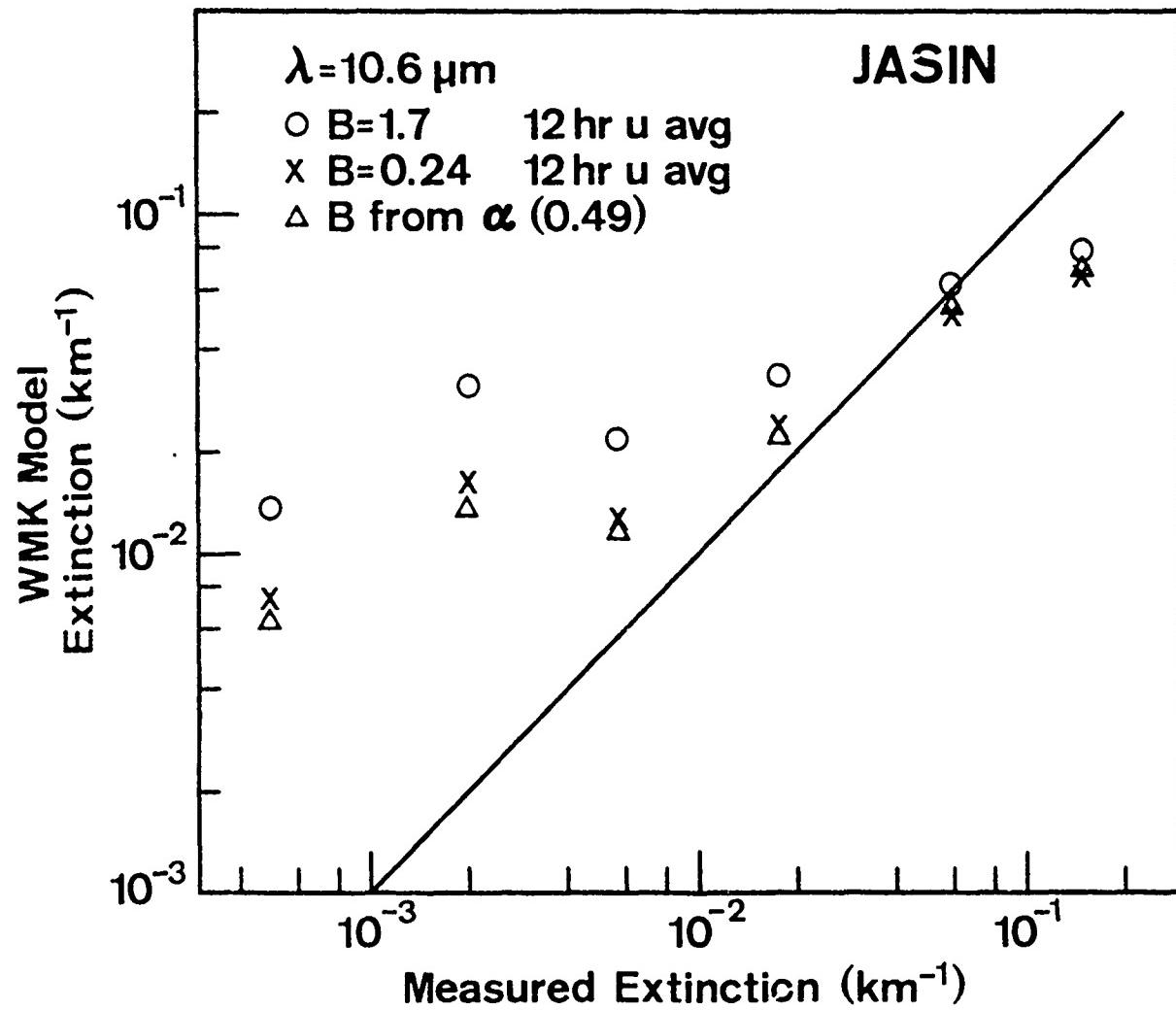


Figure 5. WMK Model Predictions of  $\lambda = 10.6 \mu\text{m}$  Aerosol Extinction as a Function of Extinction Actually Observed (circles -  $B = 1.7$ , X's -  $B = 0.24$ , triangles -  $B$  taken from Fig. 6).

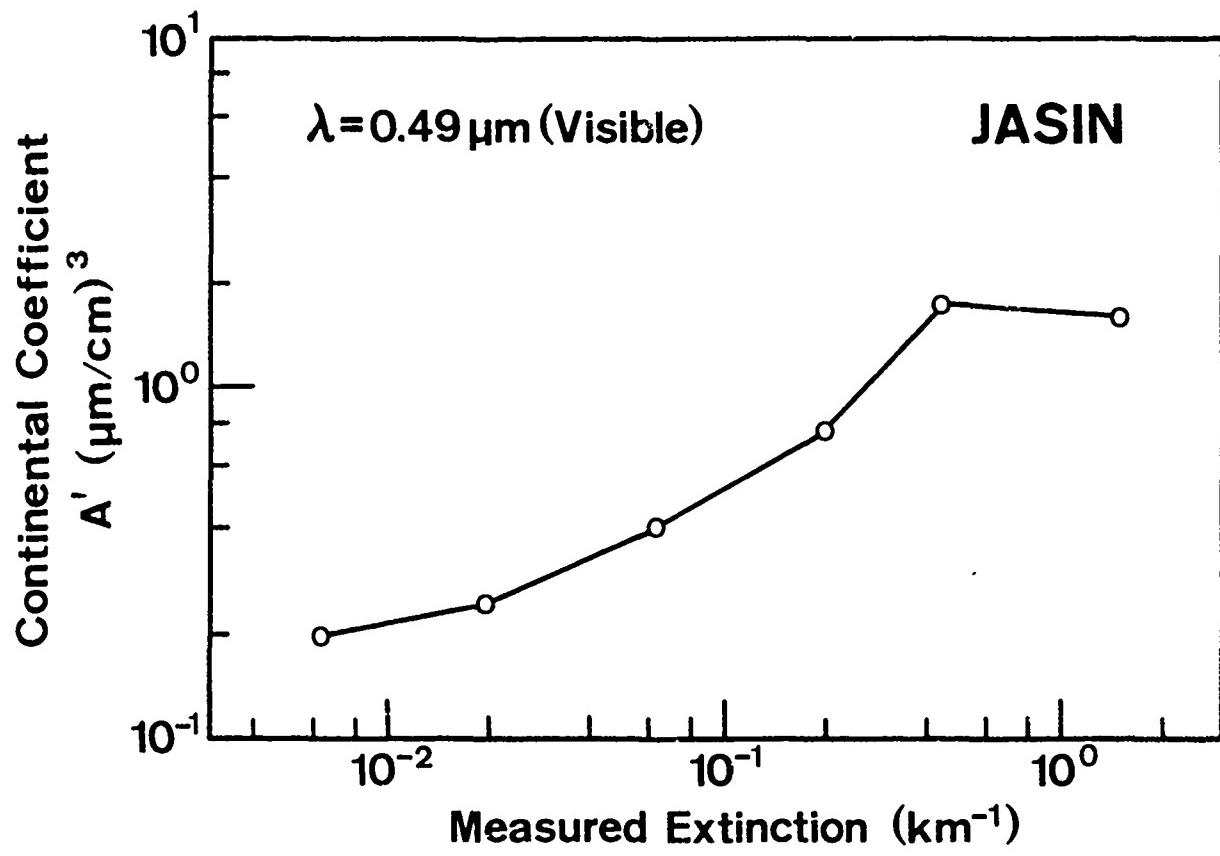


Figure 6. Continental Aerosol Coefficient  $A' = \frac{4}{3} \pi B$  versus Measured Extinction in the visible ( $\lambda = 0.49 \mu\text{m}$ ).

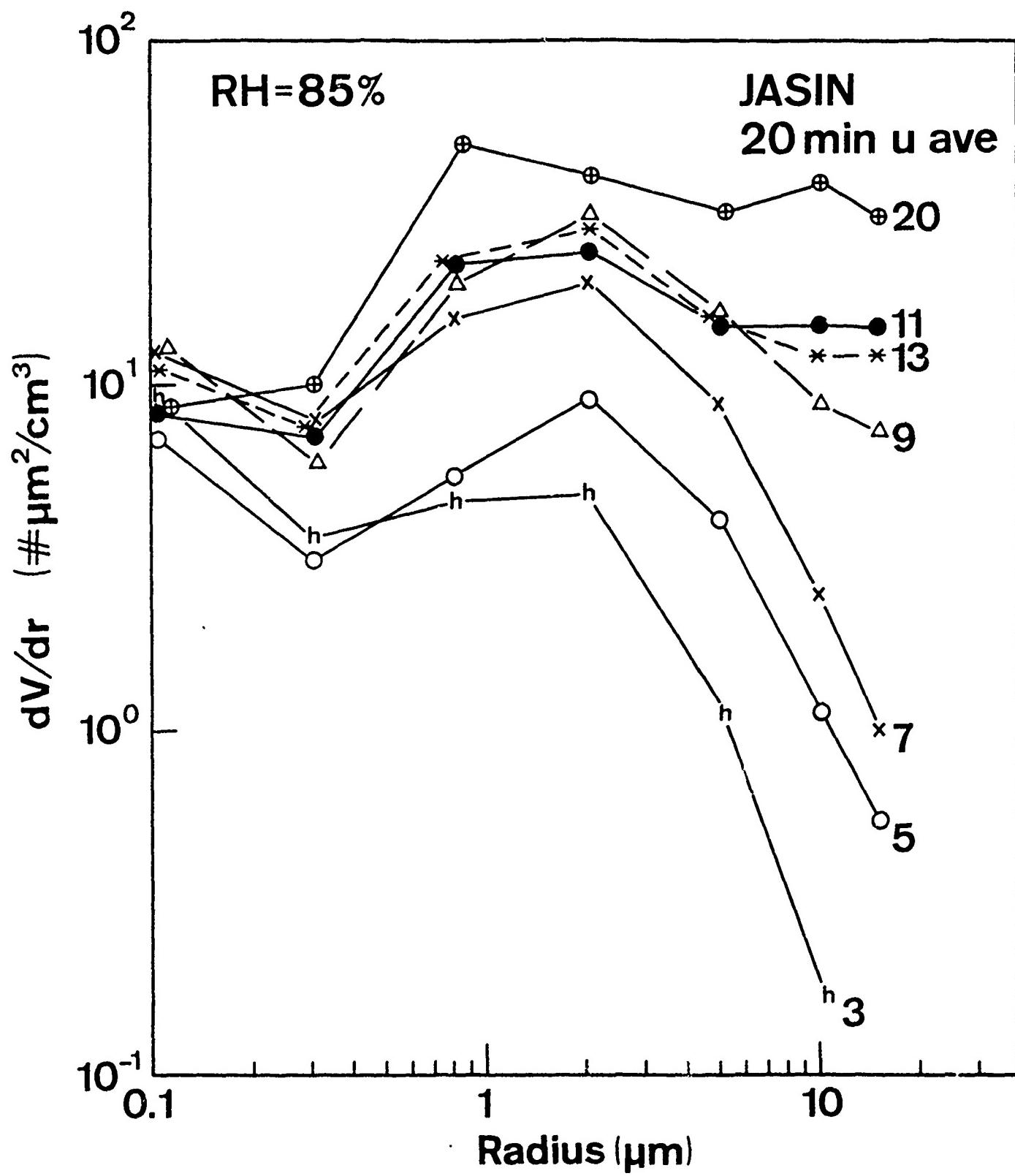


Figure 7. Ensemble Average Aerosol Volume Spectra,  $V(r)$ , Versus Particle Radius at Various Wind Speeds. The Particles at  $r = 0.1\mu\text{m}$  are Primarily of Continental Origin.

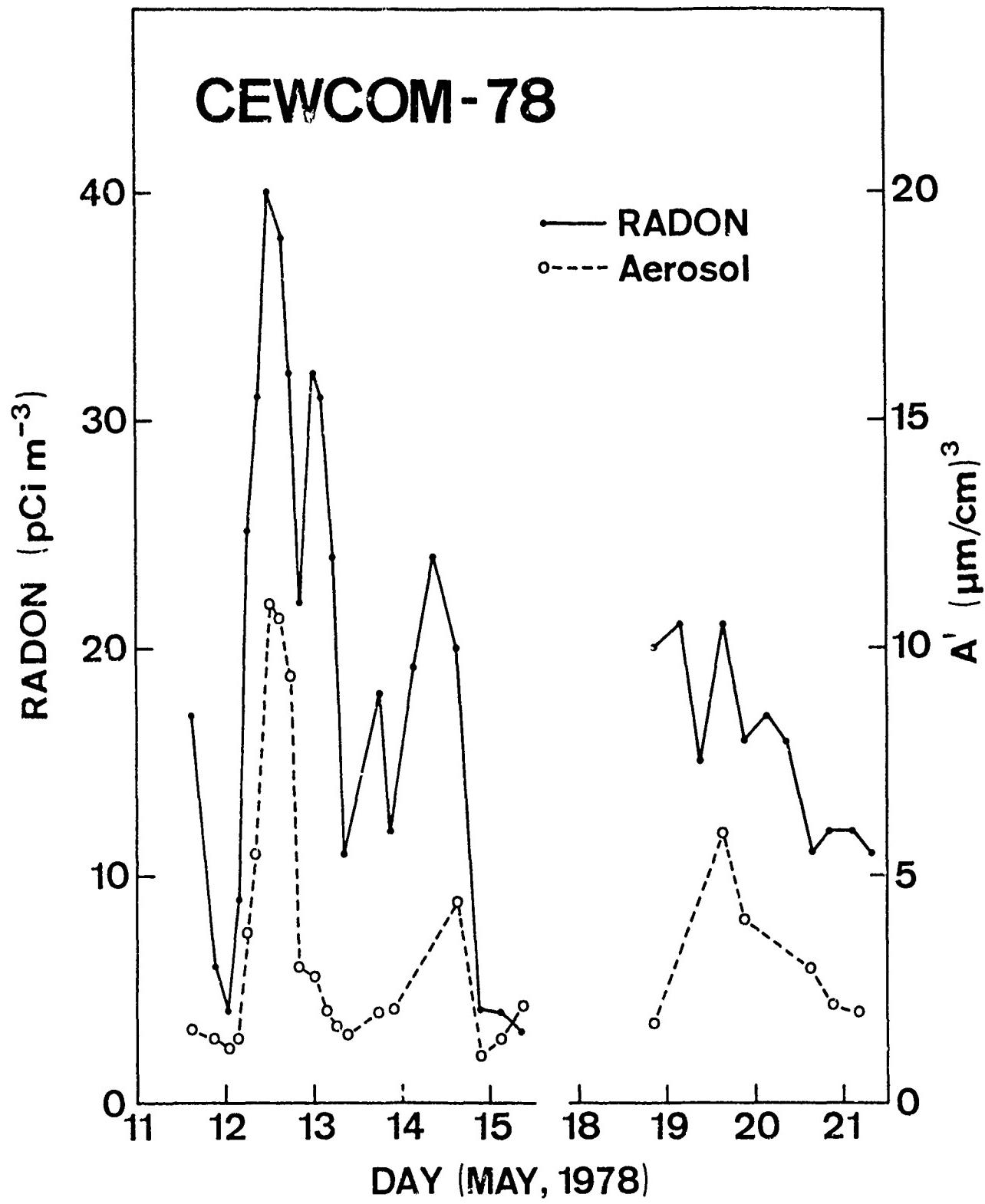


Figure 8. Atmospheric Radon Activity (Solid Line) and Continental Aerosol Coefficient (Dashed Line), During CEWCOM-78.

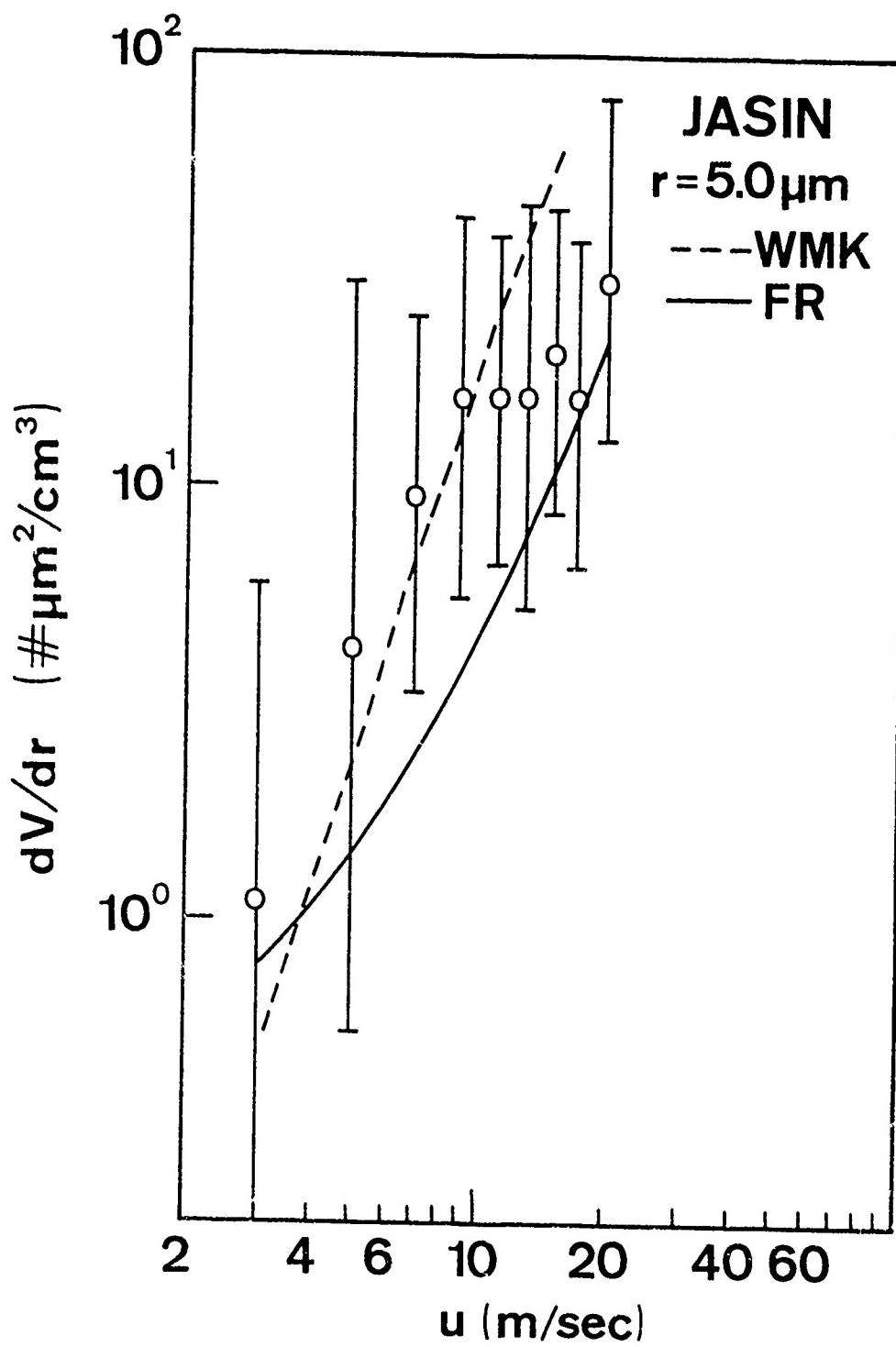


Figure 9. Aerosol Volume Spectral Density  $dV/dr = V(r)$  Versus Wind Speed at  $r = 5.0 \mu\text{m}$ . The Circles are the JASIN Data, the Dashed Line is the WMK Model and the Solid Line is a Model from Fitzgerald and Ruskin (1975).

Fig. 5). If we go one step further and use the visible wavelength extinction with Fig. 6 to estimate the value of  $A'$ , then we see virtually no improvement (triangles in Fig. 5). At this point, the discrepancy is due to the sea salt component.

E. DISCUSSION

In the previous section we found that, if given a wind speed and humidity, the WMK was a good predictor of the average extinction observed, although 30% of the observations disagreed by more than a factor of 3. On average, the predictions based on 12 hour averages of wind speed were better than those based on 20 minute averages. The model was less successful when compared point by point with the actual observed extinction. In this case the 20 minute averages were slightly better. Some of the disagreement at high visibility was corrected by using a more realistic continental aerosol coefficient, the remainder is due to considerable overestimation of the sea salt component in roughly 20% of the samples.

It is important to realize that the WMK model is an average continental, equilibrium surface generation model. Deviations of the continental aerosol were shown in Figs. 6 and 8. The sea salt component is also subject to considerable deviations from equilibrium (this is one of the reasons for the 12 hour average wind speeds). This is further illustrated in Fig. 9 where measured  $V_s(r)$  spectra are compared to the WMK model prediction (taken from Eqs. 2, 4 and 5) along with a similar type of model from Fitzgerald and Ruskin (1976). The error bars represent standard deviations (again, about a factor of three) about the equilibrium value.

The deviations from average and equilibrium values are more important for operational usage and somewhat less important for climatological and spectrum evaluation usage. An example where both usages are affected is the estimation of IR extinction using visible extinctions (visibility observations) and graphs similar to Fig 4. We have replotted the visible to IR ratio in Fig 10 with lines indicating the WMK model predictions using two different continental aerosol coefficients. Since the continental aerosol

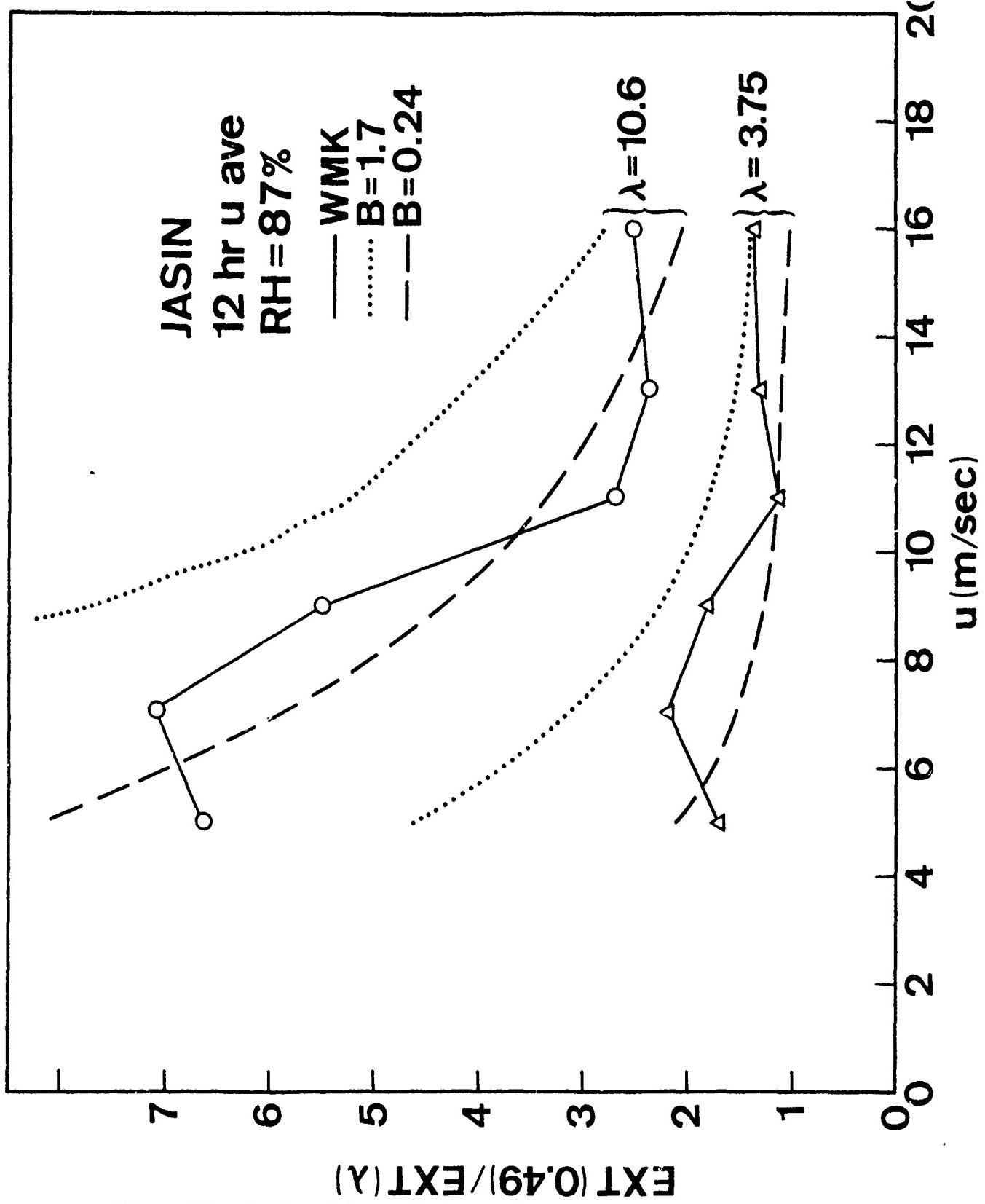


Figure 10. Ratio of Aerosol Extinction Coefficient at  $\lambda = 0.49\mu\text{m}$  to those at  $\lambda = 3.75\mu\text{m}$  and  $\lambda = 10.6\mu\text{m}$  (Circles - JASIN data, dashed line - WMK Model with  $B = 0.24$ , dotted line - WMK Model with  $B = 1.7$ ) versus Wind Speed.

coefficients are correlated to visibility (Fig. 6), the correct ratio depends not only of wind speed but also the visibility observation.

Although we have dealt with the stochastic properties of ensemble averages of the aerosols, variations about the average are not necessarily random but are primarily due to changes in synoptic and mesoscale weather patterns. In the case of the continental aerosol component, this is basically a question of air-mass history. In the case of the sea salt aerosol, it is a question of changing surface generation rates (wind speed) and the production, removal and mixing mechanisms in the marine atmospheric boundary layer. Since the surface generated aerosols are quickly mixed vertically to fill the boundary layer, rapid changes in the boundary layer height,  $h$ , will be reflected in changes in the sea salt aerosol density and, therefore, the extinction coefficient. In Fig 11 we can see that fractional variations in  $h$  are highly correlated with variations in the visible extinction. The correlation with  $10.6 \mu\text{m}$  extinction is considerably less because the large size aerosols (which are heavier contributors to IR extinctions) reach equilibrium more quickly after changes in surface conditions.

The findings and recommendations of this study are summarized below:

- 1) The WMK continental coefficient should be changed from  $B = 1.7$  to  $B = 0.24$
- 2) For climatological purposes (Fig 3), the model predictions of average extinction are very good (12 hour average wind speeds preferred).
- 3) For operational purposes (Fig 5), the model predictions of observed extinction systematically overestimate the extinction under high visibility conditions. The random error is typically a factor of 3.
- 4) Calculation of IR extinction from visibility estimates (Fig 10) is subject to systematic error due to variations in the continental background (Fig 6).
- 5) Changes in visible extinction over four hour periods can be highly correlated with changes in the mixed layer height.

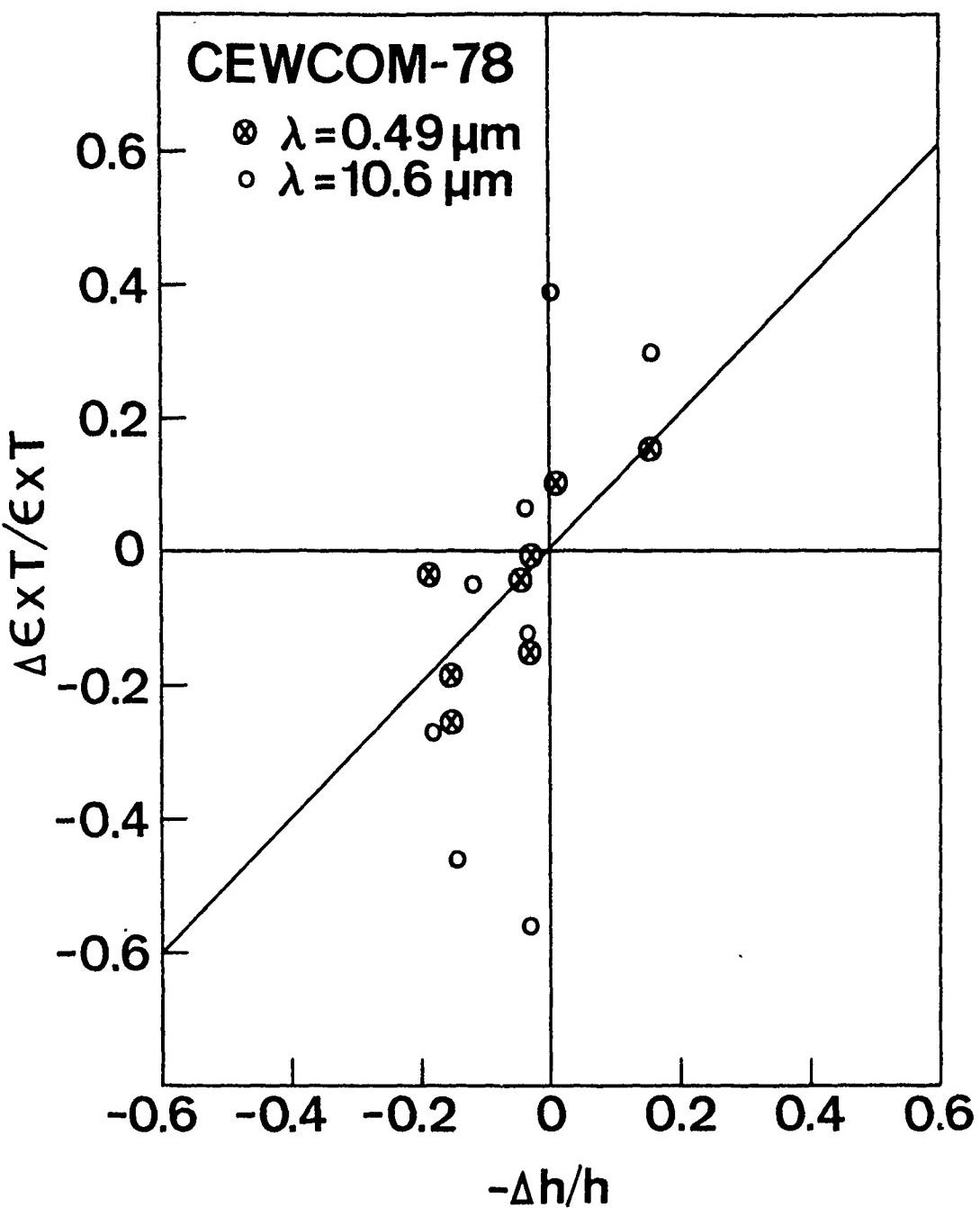


Figure 11. Fractional Change of Aerosol Extinction Coefficient (Circled X - Visible, Circles - IR) Versus Changes in Mixed Layer Height,  $h$ . The Data is for Successive Four Hour Average Periods from May 19-20 of CEWCOM-78.

## APPENDICES

APPENDIX A

Meteorological and Aerosol Extinction  
Data from JASIN. The Time is GMT.

DATE	TIME	FILE	fs G.	fair G.	RH %	W/S	U %	Extinction km^-1
								3.250 3.250
8/17/78	14:36	1	13.7	14.3	79.0	10.0	.967E-04	.330E-04
8/17/78	14:53	2	13.7	14.3	84.0	3.9	.435E+00	.361E-04
8/17/78	15:13	3	13.5	14.3	82.0	7.5	.104E+00	.241E-04
8/19/78	05:57	19	42.8	43.4	80.0	10.4	.202E+00	.209E+00
8/19/78	06:57	17	42.8	43.3	74.0	10.1	.336E+00	.253E+00
8/19/78	06:57	18	42.8	43.4	68.0	10.6	.345E+00	.254E+00
8/19/78	07:17	19	42.8	43.4	67.0	11.0	.320E+00	.233E+00
8/19/78	07:37	20	42.8	43.4	90.0	11.0	.318E+00	.233E+00
8/19/78	08:37	23	42.8	43.6	86.0	11.3	.304E+00	.217E+00
8/19/78	08:57	24	42.8	43.6	88.0	11.0	.369E+00	.287E+00
8/19/78	09:17	25	42.8	43.5	86.0	10.9	.384E+00	.306E+00
8/19/78	09:37	26	42.8	43.6	86.0	11.3	.373E+00	.297E+00
8/19/78	09:57	27	42.8	43.6	86.0	11.3	.383E+00	.308E+00
8/19/78	10:17	28	42.8	43.6	83.0	11.4	.369E+00	.289E+00
8/19/78	10:37	30	42.8	43.7	68.0	12.0	.367E+00	.277E+00
8/19/78	11:17	31	42.8	43.8	63.0	11.6	.384E+00	.300E+00
8/19/78	11:37	32	42.8	43.8	60.0	11.7	.393E+00	.313E+00
8/19/78	11:57	33	42.8	44.0	57.0	11.7	.369E+00	.286E+00
8/19/78	12:57	34	42.8	43.6	76.0	11.9	.544E+00	.417E+00
8/19/78	13:17	37	42.8	43.6	84.0	12.2	.417E+00	.329E+00
8/19/78	13:37	38	42.8	43.7	84.0	14.9	.388E+00	.305E+00

DATE	TIME	FILE	VIS	YR/DE	RH	0 M/S	Extinction (Km^-1)
8/19/78	13:57	39	42.8	13.7	84.0	11.2	.343E+00 .3250-- .1052--
8/19/78	15:17	43	42.8	13.6	87.0	11.9	.329E+00 .269E+00 .141E+00
8/19/78	15:37	44	42.8	13.3	90.0	12.0	.337E+00 .270E+00 .145E+00
8/19/78	15:57	45	42.8	13.1	91.0	11.6	.294E+00 .234E+00 .146E+00
8/19/78	16:17	46	42.8	13.0	91.0	11.3	.382E+00 .320E+00 .186E+00
8/19/78	16:37	47	42.8	13.0	92.0	10.6	.403E+00 .354E+00 .190E+00
8/19/78	16:57	48	42.8	13.0	92.0	10.7	.303E+00 .258E+00 .121E+00
8/19/78	17:17	49	42.8	13.1	91.0	10.9	.273E+00 .235E+00 .106E+00
8/19/78	17:37	50	42.8	13.1	91.0	11.1	.256E+00 .224E+00 .101E+00
8/19/78	17:57	51	42.8	13.1	91.0	10.6	.346E+00 .311E+00 .165E+00
8/19/78	18:17	52	42.8	13.0	92.0	11.0	.263E+00 .233E+00 .107E+00
8/19/78	18:37	53	42.8	13.1	85.0	10.4	.228E+00 .198E+00 .838E-01
8/19/78	19:57	57	42.8	13.1	66.0	9.9	.225E+00 .187E+00 .795E-01
8/19/78	20:17	58	42.8	13.1	66.0	9.4	.249E+00 .209E+00 .953E-01
8/19/78	20:37	59	42.8	13.0	64.0	10.0	.201E+00 .155E+00 .643E-01
8/19/78	20:57	60	42.8	12.8	66.0	10.3	.376E+00 .317E+00 .170E+00
8/19/78	21:17	61	42.8	12.7	68.0	11.6	.315E+00 .268E+00 .143E+00
8/19/78	21:37	62	42.8	12.7	67.0	11.6	.312E+00 .253E+00 .149E+00
8/19/78	21:57	63	42.8	12.9	66.0	11.9	.385E+00 .319E+00 .161E+00
8/19/78	22:17	64	42.8	12.7	68.0	12.1	.346E+00 .285E+00 .134E+00
8/19/78	22:37	65	42.8	12.8	67.0	12.0	.317E+00 .255E+00 .141E+00
8/19/78	22:57	66	42.8	12.8	68.0	11.9	.273E+00 .220E+00 .921E-01

DATE	TIME	FILE	Ts C°	Tair C°	RH %	U m/s	4880 nm	Extinction (Km^-1)		
								250	2750	
8/19/78	23:12	67	12.6	12.0	68.0	56.9	.317E+0.0	.274E+0.0	.133E+0.0	
8/19/78	23:37	68	12.3	12.3	67.0	54.9	.258E+0.0	.215E+0.0	.100E+0.0	
8/20/78	05:54	69	12.6	12.6	64.0	59.9	.326E+0.0	.189E+0.0	.771E-0.1	
8/20/78	06:54	70	12.3	12.6	65.0	59.3	.246E+0.0	.187E+0.0	.694E-0.1	
8/20/78	07:04	71	12.0	12.5	67.0	50.0	.163E+0.0	.129E+0.0	.498E-0.1	
8/20/78	08:54	73	12.0	12.7	65.0	50.9	.212E+0.0	.174E+0.0	.704E-0.1	
8/20/78	09:14	74	12.0	12.7	66.0	51.2	.220E+0.0	.177E+0.0	.712E-0.1	
8/20/78	09:34	75	12.0	12.7	67.0	54.9	.356E+0.0	.290E+0.0	.155E+0.0	
8/20/78	09:54	76	12.0	12.0	86.0	44.6	.162E+0.0	.116E+0.0	.404E-0.1	
A-4	8/20/78	10:14	77	12.0	11.9	84.0	.14.2	.161E+0.0	.113E+0.0	.371E-0.1
8/20/78	10:34	78	12.0	12.0	85.0	51.4	.480E+0.0	.345E+0.0	.374E-0.1	
8/20/78	10:54	79	12.0	12.2	91.0	57.5	.104E+0.0	.129E+0.0	.469E-0.1	
8/20/78	11:14	80	12.0	12.4	102.0	59.3	.243E+0.0	.176E+0.0	.619E-0.1	
8/20/78	12:54	85	12.0	12.2	111.0	54.6	.374E+0.0	.278E+0.0	.151E+0.0	
8/20/78	13:14	86	12.0	11.9	116.0	51.1	.302E+0.0	.299E+0.0	.166E+0.0	
8/20/78	13:34	87	12.0	11.9	116.0	53.4	.177E+0.1	.130E+0.1	.985E+0.0	
8/20/78	15:14	92	12.0	12.7	93.0	56.8	.546E+0.0	.354E+0.0	.245E+0.0	
8/20/78	15:54	94	12.0	11.8	72.0	59.7	.342E+0.0	.226E+0.0	.452E+0.0	
8/20/78	16:14	95	12.0	11.6	71.0	54.4	.462E+0.0	.316E+0.0	.219E+0.0	
8/20/78	16:34	96	12.0	11.3	72.0	51.9	.337E+0.0	.234E+0.0	.154E+0.0	
8/20/78	16:54	97	12.0	11.3	73.0	50.7	.304E+0.0	.219E+0.0	.148E+0.0	
	8/20/78	17:14	98	12.0	11.6	73.0	49.5	.324E+0.0	.228E+0.0	.162E+0.0

DATE	TIME	FILE	T <sub>S</sub> °C	T <sub>AIR</sub> °C	RH %	U M/S	Extinction (KM <sup>-1</sup> ) -3.250	Extinction (KM <sup>-1</sup> ) -3.250
9/20/78	17:34	99	12.8	14.7	77.0	16.4	.242E+00	.124E+00
9/20/78	17:54	100	12.8	14.9	75.0	16.4	.240E+00	.106E+00
8/20/78	16:14	101	12.8	12.3	71.0	17.9	.206E+00	.159E+00
8/20/78	19:14	104	12.8	12.4	70.0	14.4	.438E+01	.647E+00
8/20/78	19:34	105	12.8	11.8	76.0	13.6	.344E+00	.225E+00
8/20/78	19:54	106	12.8	12.3	74.0	13.5	.330E+00	.235E+00
8/20/78	20:14	107	12.8	12.5	71.0	15.5	.318E+00	.220E+00
8/20/78	20:34	108	12.8	12.5	72.0	15.7	.329E+00	.233E+00
8/20/78	20:54	109	12.8	12.4	75.0	14.9	.430E+00	.303E+00
8/20/78	21:14	110	12.8	12.4	76.0	15.3	.404E+00	.277E+00
8/20/78	21:34	111	12.8	12.3	77.0	14.7	.373E+00	.253E+00
8/20/78	21:54	112	12.8	12.5	75.0	14.8	.393E+00	.278E+00
8/20/78	22:14	113	12.8	12.5	73.0	14.5	.390E+00	.273E+00
8/20/78	22:34	114	12.8	12.6	70.0	15.6	.344E+00	.242E+00
8/20/78	22:54	115	12.8	12.7	69.0	14.6	.332E+00	.241E+00
8/20/78	23:14	116	12.8	12.6	70.0	15.2	.335E+00	.232E+00
8/20/78	23:34	117	12.8	12.6	69.0	15.6	.339E+00	.226E+00
8/20/78	23:54	118	12.8	12.6	71.0	14.4	.320E+00	.228E+00
8/21/78	00:14	119	12.8	12.6	75.0	14.2	.329E+00	.232E+00
8/21/78	00:34	120	12.8	12.5	75.0	14.6	.285E+00	.207E+00
8/21/78	00:54	121	12.8	12.5	76.0	14.6	.318E+00	.234E+00
8/21/78	01:14	122	12.8	12.4	77.0	14.4	.296E+00	.214E+00

DATE	TIME	FILE	Ts °C	Tair °C	RH %	U W/S	Extinction (Km^-1)
8/21/78	04:34	423	12.8	12.4	77.0	14.2	.294E+00 .219E+00 .432E+00
8/21/78	04:54	424	12.8	12.4	80.0	13.8	.342E+00 .235E+00 .439E+00
8/21/78	02:44	425	12.8	12.3	80.0	14.7	.254E+00 .190E+00 .112E+00
8/21/78	02:34	426	12.8	12.3	81.0	13.6	.256E+00 .194E+00 .114E+00
8/21/78	02:54	427	12.8	12.3	81.0	13.6	.258E+00 .198E+00 .113E+00
8/21/78	03:14	428	12.8	12.3	81.0	13.7	.226E+00 .174E+00 .997E-01
8/21/78	03:34	429	12.8	12.3	82.0	13.2	.240E+00 .185E+00 .106E+00
8/21/78	03:54	430	12.8	12.2	83.0	12.9	.240E+00 .187E+00 .110E+00
8/21/78	04:14	431	12.8	12.2	84.0	13.0	.225E+00 .182E+00 .982E-01
A-6	04:34	432	12.8	12.4	85.0	12.7	.217E+00 .179E+00 .933E-01
	04:54	433	12.8	11.9	87.0	12.4	.289E+00 .230E+00 .139E+00
	05:14	434	12.8	11.9	86.0	12.4	.193E+00 .154E+00 .823E-01
	05:34	435	12.8	12.4	83.0	12.4	.177E+00 .148E+00 .787E-01
	05:54	436	12.8	12.4	82.0	11.4	.161E+00 .135E+00 .641E-01
	06:14	437	12.8	12.2	83.0	11.1	.168E+00 .142E+00 .659E-01
8/21/78	06:34	438	12.8	12.4	83.0	10.9	.167E+00 .141E+00 .659E-01
8/21/78	06:54	439	12.8	12.4	82.0	10.3	.158E+00 .135E+00 .588E-01
8/21/78	07:14	440	12.8	12.4	83.0	10.4	.155E+00 .133E+00 .643E-01
8/21/78	07:37	443	12.5	12.9	80.0	10.3	.142E+00 .131E+00 .575E-01
8/21/78	11:57	444	12.5	12.7	78.0	10.8	.124E+00 .104E+00 .418E-01
8/21/78	12:17	445	12.5	12.3	84.0	9.3	.100E+00 .930E-01 .405E-01
8/21/78	13:57	447	12.5	12.4	83.0	10.6	.126E+00 .114E+00 .445E-01

DATE	TIME	FILE	1s %	1ns %	RH %	0 N/S	4980 --	Extinction (Km^-1)
8/24/78	14:17	148	12.5	12.4	81.0	40.8	.974E-04	.752E-04
8/24/78	14:37	149	12.5	12.4	74.0	9.5	.103E+00	.661E-04
8/24/78	14:57	150	12.5	12.5	81.0	9.5	.435E+00	.122E+00
8/24/78	16:17	154	12.5	12.0	87.0	40.2	.152E+00	.139E+00
8/24/78	16:37	155	12.5	12.2	86.0	8.9	.133E+00	.117E+00
8/24/78	16:57	156	12.5	12.3	83.0	9.1	.950E+01	.814E+01
8/24/78	17:37	158	12.5	12.3	90.0	45.3	.976E+01	.742E+01
8/24/78	18:17	160	12.5	12.2	109.0	40.5	.447E+00	.140E+00
8/24/78	18:37	161	12.5	12.2	110.0	40.1	.149E+00	.136E+00
8/24/78	18:57	162	12.5	12.1	113.0	9.5	.150E+00	.139E+00
8/24/78	20:17	166	12.5	12.2	112.0	9.7	.406E+00	.955E+01
8/24/78	20:37	167	12.5	12.2	115.0	41.4	.196E+00	.180E+00
8/24/78	20:57	168	12.5	12.1	116.0	40.3	.217E+00	.205E+00
8/24/78	21:17	169	12.5	12.1	114.0	41.4	.164E+00	.143E+00
8/24/78	22:17	172	12.5	12.0	100.0	43.0	.147E+00	.108E+00
8/24/78	22:37	173	12.5	11.9	99.0	40.0	.182E+00	.164E+00
8/24/78	22:57	174	12.5	11.7	98.0	9.4	.406E+00	.103E+00
8/24/78	04:17	175	12.5	11.5	97.0	9.7	.840E-04	.774E+01
8/24/78	04:37	182	12.5	12.1	92.0	9.7	.703E-04	.625E-04
8/24/78	04:57	183	12.5	12.0	94.0	9.5	.890E-04	.889E-01
8/24/78	02:17	184	12.5	11.7	97.0	9.4	.802E-04	.756E+01
8/24/78	04:17	188	12.3	11.4	466.0	7.7	.119E+00	.114E+00

DATE	TIME	FILE	rs C.	Tair C.	RH %	U m/s	A -4990 -3250	Extinction (km^-1)
8/22/78	04:30	189	12.4	14.4	94.0	8.5	.922E-04	.944E-04
8/22/78	05:58	190	12.4	14.5	90.0	8.6	.927E-04	.856E-04
8/22/78	06:48	191	12.4	13.5	90.0	8.0	.107E+00	.102E+00
8/22/78	06:58	192	12.3	14.7	90.0	9.5	.126E+00	.120E+00
8/22/78	06:58	193	12.3	14.8	90.0	14.9	.116E+00	.974E-04
8/22/78	07:13	194	12.4	14.9	69.0	14.1	.934E-04	.725E-04
8/22/78	07:38	195	12.4	12.0	97.0	12.7	.942E-04	.807E-04
8/22/78	07:58	196	12.4	12.2	87.0	7.5	.944E-04	.874E-04
8/22/78	08:13	197	12.4	12.2	88.0	8.3	.107E+00	.100E+00
A-8	8/23/78	00:05	199	12.4	14.8	93.0	9.4	.653E-04
	8/23/78	00:25	200	12.4	14.6	84.0	10.8	.526E-04
	8/23/78	00:45	201	12.4	14.8	80.0	16.3	.478E-04
	8/23/78	01:05	202	12.4	14.9	81.0	15.4	.775E-04
	8/23/78	01:25	203	12.4	14.9	88.0	15.0	.143E+00
	8/23/78	01:45	204	12.4	14.3	92.0	9.2	.838E-04
	8/23/78	02:05	205	12.4	14.4	94.0	8.0	.634E-04
	8/23/78	02:25	206	12.4	14.7	85.0	8.6	.589E-04
8/23/78	03:05	208	12.4	14.3	80.0	15.9	.930E-04	.749E-04
8/23/78	03:25	209	12.4	12.2	82.0	16.2	.114E+00	.937E-04
8/23/78	03:45	210	12.4	12.4	79.0	15.3	.856E-04	.679E-04
8/23/78	04:05	211	12.4	12.4	83.0	15.8	.103E+00	.882E-04
8/23/78	04:25	212	12.4	12.4	83.0	15.8	.....	.511E-04

DATE	TIME	FILE	T <sub>S</sub> C°	T <sub>air</sub> C°	RH %	U M/S	-4380 --	Extinction (Km^-1) -3250 --	-40.52 --
8/23/78	04:25	212	12.1	12.3	83.0	15.4	.844E-01	.691E-01	.346E-01
8/23/78	04:45	213	12.4	12.3	86.0	14.0	.973E-01	.821E-01	.376E-01
8/23/78	05:05	214	12.4	12.2	88.0	7.0	.105E+00	.969E-01	.472E-01
8/23/78	05:25	215	12.4	12.1	88.0	7.2	.124E+00	.118E+00	.543E-01
8/23/78	05:44	216	12.5	12.0	87.0	8.7	.101E+00	.693E-01	.375E-01
8/23/78	07:12	217	12.5	12.2	81.0	9.3	.649E-01	.505E-01	.154E-01
8/23/78	07:32	218	12.5	12.0	82.0	9.5	.835E-01	.686E-01	.269E-01
8/23/78	07:52	219	12.5	12.1	79.0	10.3	.789E-01	.669E-01	.311E-01
8/23/78	08:12	220	12.5	12.1	81.0	17.3	.617E-01	.454E-01	.125E-01
8/23/78	08:32	221	12.5	11.9	84.0	17.9	.108E+00	.895E-01	.347E-01
8/23/78	08:52	222	12.5	11.9	82.0	15.6	.796E-01	.673E-01	.274E-01
8/23/78	09:12	223	12.5	12.0	82.0	9.3	.874E-01	.800E-01	.354E-01
8/23/78	09:32	224	12.5	11.9	84.0	8.7	.944E-01	.868E-01	.355E-01
8/23/78	09:46	225	12.5	12.1	81.0	8.5	.756E-01	.665E-01	.212E-01
8/23/78	11:14	226	12.5	12.2	82.0	9.0	.104E+00	.941E-01	.484E-01
8/23/78	11:34	227	12.5	12.0	84.0	11.3	.856E-01	.753E-01	.326E-01
8/23/78	11:54	228	12.5	11.7	86.0	10.1	.935E-01	.885E-01	.520E-01
8/23/78	11:58	229	12.5	11.6	86.0	13.9	.328E-01	.230E-01	.348E-02
8/23/78	13:28	230	12.5	12.2	83.0	9.8	.695E-01	.626E-01	.309E-01
8/23/78	13:48	231	12.5	12.5	80.0	10.7	.805E-01	.706E-01	.354E-01
8/23/78	14:08	232	12.5	12.6	83.0	8.6	.969E-01	.924E-01	.436E-01
8/23/78	14:18	233	12.5	12.4	83.0	14.3	.792E-01	.716E-01	.300E-01

DATE	TIME	FILE	T <sub>S</sub> °C	Tair °C	RH %	U W/S	Abs 4880 Å	Abs 3750 Å	Extinction (Km <sup>-1</sup> )
8/23/78	15:29	234	12.5	13.1	78.0	9.0	.686E-01	.663E-01	.274E-01
8/23/78	15:48	235	12.5	13.1	79.0	9.1	.759E-01	.668E-01	.290E-01
8/23/78	16:06	236	12.5	13.0	81.0	8.6	.789E-01	.727E-01	.345E-01
8/23/78	16:28	237	12.5	12.9	84.0	14.2	.965E-01	.712E-01	.284E-01
8/23/78	16:43	238	12.5	12.4	87.0	15.4	.146E+00	.128E+00	.735E-01
8/23/78	17:03	239	12.5	12.3	83.0	13.8	.112E+00	.999E-01	.492E-01
8/23/78	17:28	240	12.5	12.3	86.0	15.8	.119E+00	.978E-01	.559E-01
8/23/78	17:48	241	12.5	12.3	93.0	14.8	.989E-01	.866E-01	.454E-01
8/23/78	20:48	250	12.5	11.9	102.0	13.7	.627E-01	.424E-01	.169E-01
8/23/78	21:08	251	12.5	12.0	95.0	10.5	.690E-01	.593E-01	.333E-01
8/23/78	21:28	252	12.5	12.0	100.0	9.3	.640E-01	.652E-01	.234E-01
8/23/78	21:48	253	12.5	11.6	105.0	17.0	.204E+00	.182E+00	.105E+00
8/23/78	22:48	256	12.5	11.6	95.0	10.7	.134E+00	.115E+00	.534E-01
8/23/78	23:08	257	12.5	11.8	96.0	9.9	.107E+00	.944E-01	.452E-01
8/23/78	23:28	258	12.5	12.0	97.0	9.4	.114E+00	.102E+00	.440E-01
8/24/78	01:28	264	12.5	12.3	84.0	11.3	.894E-01	.714E-01	.327E-01
8/24/78	01:47	265	12.5	12.6	84.0	9.8	.202E+00	.167E+00	.654E-01
8/24/78	11:37	266	12.5	12.7	64.0	9.4	.464E+00	.124E+00	.420E-01
8/24/78	11:47	267	12.5	12.7	80.0	13.1	.169E+00	.120E+00	.411E-01
8/24/78	13:13	268	12.5	12.7	79.0	9.4	.161E+00	.123E+00	.440E-01
8/24/78	13:33	269	12.5	12.9	79.0	8.5	.175E+00	.138E+00	.475E-01
8/24/78	13:53	270	12.5	12.9	74.0	9.9	.181E+00	.139E+00	.539E-01

A-10

DATE	TIME	FILE #	YR	YMD	RH	0	H/S	Extinction (Km^-1)
8/24/78	14:15	271	12.5	12.7	71.0	10.4	.457E+00	.117E+00 .420E-01
8/24/78	14:33	272	12.5	12.9	63.0	9.3	.459E+00	.120E+00 .448E-01
8/24/78	14:53	273	12.5	13.1	67.0	8.7	.462E+00	.120E+00 .465E-01
8/24/78	15:13	274	12.5	13.1	65.0	9.4	.469E+00	.120E+00 .428E-01
8/24/78	15:33	275	12.5	13.2	64.0	9.7	.466E+00	.124E+00 .456E-01
8/24/78	15:53	276	12.5	13.2	62.0	8.8	.459E+00	.113E+00 .379E-01
8/24/78	16:13	277	12.5	13.3	62.0	9.0	.466E+00	.125E+00 .446E-01
8/24/78	16:33	278	12.5	13.3	65.0	9.3	.474E+00	.131E+00 .454E-01
8/24/78	16:53	279	12.5	13.3	74.0	9.0	.446E+00	.103E+00 .329E-01
A-1	17:05	280	12.5	13.2	77.0	8.5	.472E+00	.123E+00 .423E-01
A-1	21:34	282	12.5	12.4	75.0	12.7	.456E+00	.110E+00 .357E-01
8/24/78	20:54	283	12.5	12.0	77.0	10.5	.443E+00	.989E-01 .259E-01
8/24/78	21:14	284	12.5	11.9	79.0	6.3	.445E+00	.112E+00 .312E-01
8/24/78	21:34	285	12.5	11.9	81.0	6.4	.446E+00	.113E+00 .326E-01
8/24/78	22:34	286	12.5	11.9	85.0	9.5	.425E+00	.889E-01 .191E-01
8/24/78	22:54	287	12.5	11.9	83.0	5.2	.455E+00	.130E+00 .410E-01
8/24/78	23:14	290	12.5	11.8	84.0	5.3	.455E+00	.126E+00 .388E-01
8/25/78	03:34	303	12.5	11.9	79.0	6.2	.444E+00	.834E-01 .189E-01
8/25/78	05:54	304	12.5	11.9	80.0	5.8	.444E+00	.849E-01 .177E-01
8/25/78	04:44	305	12.5	11.9	83.0	7.4	.443E+00	.845E-01 .187E-01
8/25/78	05:34	309	12.5	12.0	63.0	6.4	.420E+00	.878E-01 .171E-01
8/25/78	05:54	310	12.5	12.0	84.0	6.3	.447E+00	.885E-01 .166E-01

A-1

DATE	TIME	FILE	Ts	Cir	RH	U	W/S	Extinction (km^-1)
			°C	°C	%	m	m	-3.750--
8/25/78	06:14	344	42.5	12.0	94.0	6.5	.415E+00	.860E-01
8/25/78	07:36	343	42.5	12.3	79.0	6.0	.314E+00	.848E-01
8/25/78	07:58	344	42.5	12.2	80.0	5.7	.411E+00	.862E-01
8/25/78	08:16	343	42.5	12.2	79.0	6.0	.402E+00	.868E-01
8/25/78	08:29	346	42.5	12.3	73.0	6.2	.405E+00	.758E-01
8/25/78	09:53	347	42.5	12.2	91.0	5.4	.915E+01	.652E-01
8/25/78	10:43	348	42.5	12.2	81.0	4.8	.840E+01	.674E-01
8/25/78	10:21	319	42.5	12.3	81.0	5.8	.639E+01	.669E-01
8/25/78	11:36	320	42.8	12.5	81.0	5.9	.974E+01	.807E-01
8/25/78	11:56	321	42.9	12.5	81.0	4.8	.739E+01	.649E-01
8/25/78	12:31	322	42.9	12.6	81.0	6.1	.695E+01	.735E-01
8/25/78	13:36	323	42.9	12.8	80.0	5.7	.638E+01	.497E-01
8/25/78	13:56	324	42.9	12.5	79.0	5.2	.590E+01	.457E-01
8/25/78	14:27	327	43.2	12.3	83.0	4.9	.417E+01	.334E-01
8/25/78	16:47	328	43.2	12.4	83.0	4.6	.391E+01	.291E-01
8/25/78	17:07	329	43.2	12.0	84.0	3.7	.409E+01	.350E-01
8/25/78	17:43	330	43.2	12.0	83.0	3.9	.328E+01	.249E+01
8/25/78	22:16	335	43.2	12.4	80.0	4.8	.427E+01	.360E+01
8/25/78	22:36	336	43.2	12.4	80.0	4.5	.371E+01	.308E+01
8/26/78	00:46	341	43.2	12.4	83.0	3.9	.671E+01	.439E+01
8/26/78	00:56	342	43.2	12.3	83.0	4.0	.724E+01	.527E+01
8/26/78	01:56	343	43.2	12.3	84.0	4.3	.448E+00	.714E+01

A-12

DATE	TIME	FILE	Ts C	Tair C	RH %	U m/s	Extinction (Km^-1)
8/26/78	02:16	347	13.2	12.3	83.0	6.3	4.07E+00 .507E-01 .437E-01
8/26/78	02:36	348	13.4	12.3	84.0	4.8	.410E+00 .224E+00 .164E+00
8/26/78	02:56	349	13.4	12.3	85.0	4.5	.864E+00 .443E+00 .345E+00
8/26/78	03:16	350	13.4	12.3	86.0	7.2	.604E+00 .225E+00 .157E+00
8/26/78	03:36	351	13.4	12.3	87.0	12.0	.448E+00 .958E-01 .529E-01
8/26/78	03:56	352	13.4	12.3	88.0	12.2	.263E+00 .602E-01 .340E-01
8/26/78	04:16	353	13.2	12.4	89.0	10.7	.493E+00 .245E+00 .162E+00
8/26/78	04:36	354	13.4	12.4	88.0	5.0	.386E+00 .137E+00 .115E+00
8/26/78	04:56	355	13.4	12.4	89.0	5.1	.202E+00 .843E-01 .622E-01
A-13	05:16	356	13.4	12.4	88.0	5.2	.857E-01 .386E-01 .204E-01
8/26/78	06:36	360	13.4	12.4	89.0	4.7	.774E+01 .665E+01 .470E+01
8/26/78	06:56	361	13.4	12.4	89.0	4.7	.248E+01 .204E+01 .137E+01
8/26/78	07:12	362	13.4	12.4	92.0	5.1	.279E+01 .240E+01 .182E+01
8/26/78	09:13	363	13.4	12.3	96.0	5.4	.248E+01 .204E+01 .137E+01
8/26/78	09:33	364	13.4	12.3	96.0	4.7	.279E+01 .240E+01 .182E+01
8/26/78	09:53	365	13.4	12.3	97.0	5.2	.122E+02 .757E+01 .693E+01
8/26/78	09:58	366	13.4	12.3	96.0	5.7	.851E+01 .747E+01 .556E+01
8/26/78	12:52	367	13.4	12.4	96.0	5.4	.284E+01 .946E+00 .609E+01
8/26/78	13:12	368	13.4	12.4	94.0	5.3	.140E+00 .288E-01 .492E+01
8/26/78	13:32	369	13.4	12.4	93.0	5.3	.820E-01 .180E-01 .845E-02
8/26/78	13:52	370	13.4	12.4	91.0	5.5	.834E-01 .160E-01 .677E-02
8/26/78	14:03	371	13.4	12.4	90.0	6.0	.562E-01 .238E-01 .762E-02

DATE	TIME	P-TIME	T <sub>s</sub>	T <sub>air</sub>	RH	U	N/S	Extinction (Km^-4)
		sec	°C	°C	%			
8/26/78	15:22	372	13.1	12.6	92.0	4.4	.277E-04	.425E-04
8/26/78	15:42	373	13.1	12.5	90.0	5.2	.282E-04	.851E-02
8/26/78	15:45	374	13.1	12.5	89.0	4.7	.348E-04	.443E-04
8/26/78	17:13	375	13.1	12.5	86.0	5.7	.207E-04	.126E-04
8/26/78	17:35	376	13.1	12.3	88.0	5.5	.181E-04	.406E-04
8/26/78	17:58	377	13.1	12.4	89.0	5.2	.224E-04	.425E-04
8/26/78	18:18	378	13.1	12.4	91.0	6.2	.332E-04	.177E-04
8/26/78	18:38	379	13.1	12.4	94.0	14.4	.421E-04	.259E-04
8/26/78	18:58	380	13.1	12.2	94.0	13.9	.249E-04	.133E-04

Date	Time	FILE	T <sub>b</sub>	Vair	RH	U	Extinction (km^-1)					
							4	6	8	3,250	3,750	
8/26/78	19:43	4	13.4	42.3	93.0	8.9	.215E-04	.103E-04	.4680	.4680	.1052	
8/26/78	19:38	2	13.4	42.4	93.0	4.2	.442E-04	.708E-02	.581E-02	.581E-02	.149E-02	
8/26/78	19:56	3	13.4	42.4	94.0	3.3	.107E-04	.584E-02	.233E-02	.233E-02	.164E-02	
8/26/78	20:13	4	13.4	42.5	85.0	3.1	.594E-02	.233E-02	.678E-03	.678E-03		
8/26/78	21:38	3	13.4	42.4	83.0	3.6	.700E-02	.411E-02	.692E-03	.692E-03		
8/26/78	21:58	7	13.4	42.5	86.0	3.3	.356E-02	.302E-02	.454E-03	.454E-03		
8/26/78	22:18	10	13.4	42.5	82.0	4.3	.497E-02	.206E-02	.286E-03	.286E-03		
8/26/78	22:38	11	13.4	42.5	80.0	7.4	.369E-02	.111E-02	.170E-03	.170E-03		
8/26/78	23:58	15	13.4	42.2	82.0	4.3	.421E-02	.425E-02	.244E-03	.244E-03		
A-15	8/27/78	00:18	16	13.4	42.0	83.0	4.0	.474E-02	.473E-02	.343E-03	.343E-03	
	8/27/78	04:38	20	13.4	41.7	87.0	5.6	.511E-02	.233E-02	.587E-03	.587E-03	
	8/27/78	02:38	23	13.4	41.5	91.0	3.8	.510E-02	.254E-02	.477E-03	.477E-03	
	8/27/78	02:58	24	13.4	41.7	94.0	3.9	.696E-02	.398E-02	.895E-03	.895E-03	
	8/27/78	03:48	25	13.4	41.7	93.0	4.1	.660E-02	.395E-02	.404E-02	.404E-02	
	8/27/78	05:18	31	13.2	41.8	100.0	5.7	.308E-04	.280E-04	.123E-01	.123E-01	
	8/27/78	05:38	32	13.2	41.7	100.0	5.7	.173E-04	.162E-04	.407E-02	.407E-02	
	8/27/78	06:58	36	13.2	42.0	95.0	5.3	.205E-04	.185E-04	.519E-02	.519E-02	
	8/27/78	07:18	37	13.2	42.2	95.0	4.8	.228E-04	.216E-04	.555E-02	.555E-02	
	8/27/78	07:38	38	13.2	42.2	94.0	4.6	.230E-04	.200E-04	.520E-02	.520E-02	
	8/27/78	07:58	39	13.2	42.3	92.0	42.3	.274E-04	.224E-04	.586E-02	.586E-02	

DATE	TIME	F/FLE	$\frac{V_0}{C_0}$	Fair	RH	$\frac{V_0}{M/S}$	$\frac{V_0}{M/S}$	Extinction ( $Km^{-1}$ )
8/27/78	03:02	40	43.2	42.6	92.0	43.7	.225E-01	.134E-01
8/27/78	03:54	41	43.2	42.4	90.0	4.6	.205E-01	.136E-01
8/27/78	09:34	42	43.2	42.4	91.0	4.2	.169E-01	.127E-01
8/27/78	09:34	43	43.2	42.5	91.0	4.0	.162E-01	.133E-01
8/27/78	10:54	44	43.2	42.2	96.0	3.8	.541E-02	.147E-02
8/27/78	11:11	45	43.2	42.3	91.0	4.2	.537E-02	.249E-02
8/27/78	11:34	46	43.2	42.4	94.0	4.0	.679E-02	.302E-02
8/27/78	12:47	47	43.2	42.4	82.0	2.6	.942E-02	.522E-02
8/27/78	13:27	49	43.2	42.7	83.0	3.5	.651E-02	.432E-02
8/27/78	13:46	50	43.1	42.7	84.0	4.3	.912E-02	.413E-02
8/27/78	16:47	51	43.5	42.3	94.0	5.6	.401E-01	.368E-01
8/27/78	17:07	52	43.6	42.2	94.0	6.3	.425E+00	.403E+00
8/27/78	17:27	53	43.6	42.4	93.0	6.6	.395E-01	.395E-01
8/27/78	17:33	54	43.6	42.4	94.0	6.0	.205E-01	.162E-01
8/27/78	18:59	56	43.6	42.0	94.0	4.7	.267E-01	.156E-01
8/27/78	19:49	57	43.6	42.4	94.0	4.6	.230E-01	.147E-01
8/27/78	19:59	58	43.6	42.0	94.0	4.4	.198E-01	.149E-01
8/27/78	19:59	59	43.6	42.4	94.0	4.8	.245E-01	.169E-01
8/27/78	20:19	60	43.6	42.4	92.0	12.7	.204E-01	.108E-01
8/27/78	20:39	61	43.6	42.0	94.0	11.9	.156E-01	.844E-02
8/27/78	20:59	62	43.6	42.0	94.0	4.3	.476E-01	.755E-02
8/27/78	21:19	63	43.6	42.0	94.0	4.3	.170E-01	.650E-02

DATE	TIME	WAVE	W <sub>5</sub>	W <sub>10</sub>	W <sub>20</sub>	W <sub>50</sub>	U	Extinction (KM^-1)
8/27/78	21:39	64	13.6	12.0	92.0	4.7	.192E-01	.592E-02
8/27/78	21:59	65	13.6	12.0	94.0	44.5	.174E-01	.786E-02
8/27/78	22:19	66	13.6	12.1	95.0	43.0	.210E-01	.962E-02
8/27/78	22:39	67	13.6	14.9	97.0	43.4	.636E-01	.337E-01
8/27/78	22:59	68	13.6	14.7	99.0	44.0	.953E-01	.599E-01
8/27/78	23:19	69	13.6	14.5	100.0	44.0	.662E-01	.349E-01
8/28/78	00:19	72	13.6	14.3	100.0	5.6	.322E-01	.227E-01
8/28/78	00:39	73	13.6	14.3	99.0	6.0	.169E-01	.441E-01
8/28/78	01:59	77	13.6	14.8	92.0	5.9	.974E-02	.527E-02
A-17	8/28/78	02:19	78	13.6	12.0	92.0	5.0	.965E-02
8/28/78	02:39	79	13.6	12.1	92.0	5.4	.401E-04	.509E-02
8/28/78	02:59	80	13.6	12.1	93.0	42.6	.114E-01	.430E-02
8/28/78	03:19	81	13.6	12.4	93.0	14.2	.168E-01	.401E-01
8/28/78	03:39	82	13.6	14.8	94.0	34.4	.113E-01	.702E-02
8/28/78	03:59	83	13.6	14.7	95.0	5.6	.127E-01	.955E-02
8/28/78	04:19	84	13.6	14.7	94.0	4.2	.975E-02	.720E-02
8/28/78	04:39	85	13.6	14.9	90.0	4.8	.444E-01	.638E-02
8/28/78	06:19	90	13.6	12.2	90.0	5.2	.129E-01	.759E-02
8/28/78	06:39	91	13.6	12.2	91.0	5.9	.195E-01	.445E-01
B/28/78	06:59	92	13.6	12.4	91.0	6.0	.456E-01	.104E-01
B/28/78	08:26	94	13.6	12.4	94.0	5.7	.763E-01	.676E-01
B/28/78	08:46	95	13.6	12.4	94.0	5.3	.393E-01	.337E-01

1

DATE	TIME	FILE	Ts °C	Tair °C	RH %	U M/S	4330 --	Extinction (Km^-1)
							3.250	3.059
8/28/78	09:00	96	13.6	12.4	95.0	5.0	.409E-01	.263E-01
8/28/78	10:23	97	13.6	12.5	93.0	5.6	.770E-01	.397E-01
8/28/78	10:43	98	13.6	12.6	93.0	5.5	.843E-01	.331E-01
8/28/78	11:04	99	13.6	12.6	94.0	7.7	.947E-01	.145E-01
8/28/78	12:20	100	13.6	13.3	98.0	7.7	.948E-01	.142E-01
8/28/78	12:40	101	13.6	13.4	97.0	7.2	.645E-01	.972E-02
8/28/78	13:00	102	13.6	13.4	95.0	7.3	.890E-01	.362E-01
8/28/78	13:06	103	13.6	13.5	86.0	6.4	.443E+00	.527E-01
8/28/78	15:45	104	13.6	13.7	83.0	7.3	.474E+00	.405E-01
8/28/78	15:55	105	13.6	13.9	80.0	7.5	.487E+00	.469E-01
8/28/78	15:53	106	13.6	14.0	78.0	7.4	.190E+00	.336E-01
8/28/78	17:17	107	13.4	13.2	88.0	8.8	.244E+00	.604E-01
8/28/78	19:32	108	13.4	13.4	88.0	7.7	.242E+00	.572E-01
8/28/78	17:57	109	13.4	13.4	89.0	7.1	.248E+00	.656E-01
8/28/78	18:00	110	13.4	13.1	90.0	7.0	.226E+00	.607E-01
8/28/78	19:07	111	13.4	13.4	89.0	42.4	.354E+00	.547E-01
8/28/78	19:27	112	13.4	13.4	94.0	6.2	.337E+00	.656E-01
8/28/78	19:47	113	13.4	13.4	92.0	6.1	.321E+00	.666E-01
8/28/78	20:07	114	13.4	13.4	95.0	6.3	.290E+00	.746E-01
8/28/78	21:47	119	13.4	13.0	90.0	7.3	.341E+00	.806E-01
8/28/78	22:07	120	13.4	12.9	88.0	8.4	.315E+00	.823E-01
8/28/78	23:27	124	13.4	12.9	94.0	8.8	.403E+01	.292E+00

DATE	TIME	FILE	TG C.	TG C.	RH %	U M/S	Extinction (km^-1)
8/23/78	23:47	425	13.4	12.9	93.0	7.5	.446E+00 .3.750..... -4.52....
8/29/78	00:07	426	13.4	12.9	94.0	6.6	.446E+00 .229E+00 .379E-04
8/29/78	01:07	427	13.4	12.8	93.0	10.7	.446E+00 .623E+00 .184E+00
8/29/78	01:27	430	13.4	12.7	93.0	7.4	.501E+00 .136E+00 .624E-04
8/29/78	01:47	431	13.4	12.7	93.0	6.7	.379E+00 .408E+00 .462E-04
8/29/78	02:07	432	13.4	12.6	94.0	8.9	.390E+00 .731E-04 .223E-04
8/29/78	02:27	433	13.4	12.6	94.0	14.9	.209E+00 .609E-04 .248E-04
8/29/78	02:47	434	13.4	12.7	94.0	15.0	.269E+00 .690E-04 .268E-04
8/29/78	03:07	435	13.4	12.7	94.0	15.0	.444E+00 .789E-04 .222E-04
8/29/78	03:27	436	13.4	12.7	94.0	15.6	.507E+00 .898E-04 .206E-04
8/29/78	03:47	437	13.4	12.6	94.0	14.6	.372E+00 .456E-04 .123E-04
8/29/78	04:27	439	13.4	12.6	92.0	7.0	.357E+00 .460E-04 .162E-04
8/29/78	04:47	440	13.4	12.6	93.0	9.1	.488E+00 .723E-04 .243E-04
8/29/78	05:07	441	13.4	12.6	94.0	13.9	.556E+00 .737E-04 .244E-04
8/29/78	05:27	442	13.4	12.5	94.0	13.3	.404E+00 .494E-04 .150E-04
8/29/78	06:07	444	13.4	12.5	92.0	5.5	.344E+00 .439E-04 .142E-04
8/29/78	06:27	445	13.4	12.3	91.0	5.4	.282E+00 .447E-04 .109E-04
8/29/78	06:47	446	13.4	12.4	90.0	9.8	.266E+00 .336E-04 .837E-02
8/29/78	07:16	449	13.4	12.5	90.0	12.2	.304E+00 .365E-04 .901E-02
8/29/78	07:56	450	13.4	12.3	91.0	2.8	.306E+00 .504E-04 .104E-04
8/29/78	08:16	451	13.4	12.3	92.0	3.3	.312E+00 .524E-04 .127E-04
8/29/78	08:26	451	13.4	12.3	92.0	3.3	.312E+00 .524E-04 .133E-04

DATE	TIME	FILE #	T <sub>0</sub>	T <sub>11P</sub>	KII	U	M/S	A4380	Extinction (Km^-1)
			...	...	...	...	...	...	...
8/29/73	19:13	152	13.4	12.5	95.0	2.6	.400E+04	.264E+00	.540E-04
6/29/73	10:33	153	13.4	12.5	95.0	2.3	.934E+00	.226E+00	.493E-04
9/ 4/73	13:53	161	13.1	12.9	93.0	9.3	.109E+02	.818E+04	.647E+04
9/ 4/73	19:33	162	13.1	12.9	93.0	9.4	.106E+02	.905E+04	.670E+04
9/ 4/73	19:33	163	13.1	12.8	93.0	8.2	.106E+02	.864E+04	.668E+04
9/ 5/73	12:56	165	12.9	12.5	92.0	8.3	.391E-04	.252E-04	.776E-02
9/ 5/73	13:16	167	12.9	12.8	84.0	8.3	.517E-04	.359E-04	.434E-04
9/ 5/73	13:30	168	12.9	12.9	84.0	8.7	.502E-04	.355E-04	.445E-04
9/ 5/73	14:45	169	12.9	13.3	78.0	7.9	.456E-04	.323E-04	.414E-04
9/ 5/73	15:05	170	12.9	13.4	73.0	8.3	.503E-04	.389E-04	.446E-04
9/ 5/73	15:47	171	12.9	13.4	76.0	9.8	.462E-04	.343E-04	.414E-04
9/ 5/73	15:29	172	12.9	13.2	76.0	16.0	.563E-04	.356E-04	.444E-04
9/ 5/73	16:42	173	12.9	12.4	82.0	9.9	.467E-04	.362E-04	.457E-04
9/ 5/73	17:02	174	12.9	12.4	83.0	9.8	.583E-04	.426E-04	.484E-04
9/ 5/73	17:09	175	12.9	12.3	85.0	10.1	.574E-04	.437E-04	.406E-04
9/ 5/73	13:53	176	12.9	11.9	87.0	11.1	.913E-04	.725E-04	.375E-04
9/ 5/73	19:13	177	12.9	11.9	90.0	10.9	.111E+00	.931E-04	.509E-04
9/ 5/73	19:23	178	12.9	11.9	90.0	12.6	.700E-04	.495E-04	.212E-04
9/ 5/73	21:04	179	12.8	11.8	86.0	12.1	.892E-04	.695E-04	.394E-04
9/ 5/73	21:17	180	12.8	11.9	86.0	13.2	.844E-04	.638E-04	.349E-04
9/ 5/73	22:44	181	12.8	12.5	85.0	11.7	.108E+00	.880E-04	.440E-04
9/ 5/73	23:03	182	12.8	12.4	86.0	12.4	.134E+00	.105E+00	.592E-04

DATE	TIME	FILE	FS %	1818 %	RH %	U N/S	Extinction (Km^-1)
			G...	G...	G...	N/S	3.250
9/ 5/78	23:53	193	42.8	42.0	92.0	20.0	.324E+00 .267E+00 .147E+00
9/ 5/78	00:13	184	12.8	11.9	39.0	20.3	.330E+00 .260E+00 .145E+00
9/ 5/78	00:55	185	12.8	11.9	37.0	18.6	.303E+00 .237E+00 .124E+00
9/ 5/78	00:41	186	12.8	11.0	36.0	17.3	.276E+00 .205E+00 .111E+00
9/ 5/78	01:29	187	12.6	11.6	85.0	15.9	.240E+00 .147E+00 .736E-01
9/ 5/78	01:49	188	12.5	11.3	85.0	16.4	.239E+00 .183E+00 .945E-01
9/ 5/78	02:09	189	12.5	11.7	85.0	16.9	.241E+00 .174E+00 .903E-01
9/ 5/78	03:04	190	12.6	11.6	83.0	13.7	.209E+00 .144E+00 .744E-01
9/ 5/78	03:48	191	12.6	11.6	83.0	13.6	.248E+00 .182E+00 .991E-01
9/ 5/78	03:59	192	12.6	11.6	83.0	13.9	.243E+00 .175E+00 .919E-01
9/ 5/78	04:49	193	12.6	11.6	82.0	13.9	.250E+00 .185E+00 .105E+00
9/ 5/78	04:34	194	12.6	11.6	82.0	13.7	.254E+00 .196E+00 .112E+00
9/ 5/78	04:54	195	12.6	11.6	83.0	14.1	.258E+00 .176E+00 .111E+00
9/ 5/78	05:19	196	12.6	11.4	83.0	15.6	.249E+00 .193E+00 .108E+00
9/ 5/78	05:59	198	12.6	11.4	82.0	14.0	.220E+00 .168E+00 .957E-01
9/ 5/78	06:19	199	12.6	11.4	82.0	13.8	.223E+00 .175E+00 .948E-01
9/ 5/78	06:39	200	12.6	11.5	81.0	13.7	.244E+00 .194E+00 .114E+00
9/ 5/78	06:59	201	12.6	11.4	81.0	13.5	.242E+00 .174E+00 .961E-01
9/ 5/78	07:14	202	12.6	11.4	82.0	13.4	.230E+00 .186E+00 .108E+00
9/ 5/78	07:39	203	12.6	11.4	84.0	13.6	.223E+00 .181E+00 .105E+00
9/ 5/78	07:59	204	12.6	11.3	79.0	14.6	.203E+00 .163E+00 .961E-01

DATE	TIME	FILE	T <sub>E</sub>	T <sub>S</sub>	Tair	RH	U	M/S	Extinction (Km^-1)
			4	5	6	%	%	M/S	-3.2750--
9/ 5/78	03:19	205	12.6	14.4	76.0	14.6	.205E+00	.160E+00	.966E-01
9/ 5/78	03:49	206	12.6	14.4	77.0	13.9	.209E+00	.161E+00	.965E-01
9/ 5/78	06:59	207	12.6	14.5	76.0	14.1	.217E+00	.172E+00	.105E+00
9/ 6/78	00:22	209	12.4	14.7	85.9	8.3	.928E-04	.560E-04	.222E-01
9/ 6/78	02:04	240	12.4	14.6	85.0	8.4	.100E+00	.740E-04	.289E-01
9/ 6/78	02:22	241	12.4	14.4	87.0	8.1	.927E-04	.676E-04	.274E-01
9/ 6/78	05:04	242	12.6	14.3	93.0	8.9	.152E+00	.134E+00	.551E-01
9/ 6/78	05:24	243	12.6	14.3	92.0	8.5	.155E+00	.129E+00	.468E-01
9/ 6/78	07:20	244	12.6	14.7	70.0	8.6	.195E+00	.114E+00	.404E-01
9/ 6/78	07:40	245	12.5	14.7	79.0	8.5	.178E+00	.977E-01	.308E-01
9/ 6/78	09:43	246	12.6	14.9	92.0	7.6	.210E+00	.109E+00	.361E-01
9/ 6/78	09:53	247	12.6	12.0	92.0	7.7	.189E+00	.994E-01	.347E-01
9/ 6/78	09:44	248	12.6	12.1	91.0	7.3	.174E+00	.951E-01	.342E-01
9/ 6/78	14:45	249	12.6	12.1	91.0	9.2	.271E+00	.226E+00	.128E+00
9/ 6/78	14:50	250	12.6	12.2	94.0	9.3	.217E+00	.184E+00	.235E-01
9/ 6/78	16:34	251	12.6	14.9	68.0	10.4	.541E-04	.363E-01	.140E-01
9/ 6/78	16:54	252	12.6	12.1	80.0	9.9	.401E-04	.347E-01	.109E-01
9/ 7/78	13:00	253	12.6	12.4	79.0	9.4	.438E-04	.395E-01	.470E-01
9/ 7/78	16:07	254	12.6	12.4	82.0	6.2	.456E-04	.407E-01	.441E-01
9/ 7/78	16:27	255	12.6	12.4	82.0	6.4	.456E-04	.415E-01	.401E-01
9/ 7/78	16:37	256	12.6	12.4	84.0	7.4	.573E-04	.496E-01	.447E-01
9/ 7/78	19:04	257	12.6	12.4	85.0	8.0	.697E-04	.604E-01	.455E-01

DATE	TIME	FILE	T <sub>S</sub> C <sub>1</sub>	T <sub>AIR</sub> C <sub>1</sub>	RH %	U Hz	Extinction (Km <sup>-1</sup> )
9/ 7/78	19:14	228	12.6	12.1	85.0	7.8	.620E-01 .575E-01 .441E-01
9/ 7/78	21:27	229	12.4	11.7	87.0	7.9	.940E-01 .718E-01 .267E-01
9/ 7/78	23:24	231	12.4	11.7	87.0	7.9	.109E+00 .647E-01 .216E-01
9/ 7/78	23:41	232	12.5	11.8	89.0	9.2	.199E+00 .729E-01 .256E-01
9/ 8/78	00:26	233	12.7	11.8	92.0	14.0	.367E+00 .764E-01 .334E-01
9/ 8/78	00:46	234	12.7	11.9	93.0	13.9	.346E+00 .727E-01 .345E-01
9/ 8/78	01:26	235	12.6	11.9	90.0	7.9	.350E+00 .150E+00 .991E-01
9/ 8/78	01:46	236	12.6	11.8	91.0	7.7	.484E+00 .197E+00 .133E+00
9/ 8/78	01:53	237	12.6	11.8	91.0	8.4	.398E+00 .132E+00 .705E-01
9/ 8/78	03:28	238	12.5	11.5	94.0	8.0	.379E+00 .164E+00 .954E-01
9/ 8/78	03:46	239	12.5	11.3	93.0	8.1	.216E+00 .114E+00 .591E-01
9/ 8/78	03:57	241	12.5	12.1	99.0	7.6	.805E+00 .495E+00 .307E+00
9/ 8/78	10:46	242	12.5	12.1	98.0	8.0	.597E+00 .333E+00 .197E+00
9/ 8/78	11:32	245	12.7	12.7	97.0	5.0	.195E+00 .136E+00 .514E-01
9/ 8/78	11:47	246	12.7	11.9	98.0	7.6	.495E-01 .415E-01 .158E-01
9/ 8/78	12:26	248	12.7	12.1	97.0	9.5	.649E-01 .591E-01 .234E-01
9/ 8/78	14:39	249	12.7	13.8	82.0	7.2	.242E+00 .194E+00 .720E-01
9/ 8/78	16:34	251	12.8	13.1	86.0	7.4	.483E+00 .150E+00 .479E-01
9/ 8/78	16:41	252	12.9	13.0	83.0	6.0	.481E+00 .157E+00 .478E-01
9/ 8/78	17:06	253	12.9	12.9	90.0	14.9	.258E+00 .206E+00 .707E-01

Date	T (°R)	F1/E	V <sub>s</sub>	V <sub>air</sub>	R1	U	M/Z	-4880	-250	Extinction (Km^-1)
9/ 8/78	17:26	254	12.4	12.9	90.0	14.7		.296E+00	.241E+00	.945E-01
9/ 8/78	17:40	255	12.9	12.3	91.0	13.8		.297E+00	.238E+00	.876E-01
9/ 8/78	18:14	256	12.3	12.9	87.0	7.4		.251E+00	.246E+00	.748E-01
9/ 8/78	18:30	257	12.3	12.8	89.0	7.2		.261E+00	.233E+00	.783E-01
9/ 8/78	21:52	258	12.8	12.9	95.0	6.2		.160E+00	.541E+00	.272E+00
9/ 8/78	22:12	259	12.0	12.9	96.0	7.8		.346E+00	.351E+00	.445E+00
9/ 8/78	22:32	260	12.0	12.9	96.0	8.1		.430E+00	.388E+00	.150E+00
9/ 8/78	22:40	261	12.0	12.8	96.0	8.5		.354E+00	.308E+00	.108E+00
9/ 8/78	23:34	262	12.0	12.6	94.0	8.3		.476E+00	.413E+00	.228E+00
9/ 8/78	23:54	263	12.0	12.5	93.0	8.2		.724E+00	.660E+00	.409E+00
9/ 9/78	00:14	264	12.0	12.4	94.0	10.4		.693E+00	.624E+00	.377E+00
9/ 9/78	00:34	265	12.0	12.4	93.0	9.2		.470E+00	.445E+00	.220E+00
9/ 9/78	01:53	268	12.0	12.6	97.0	10.6		.878E+00	.769E+00	.515E+00
9/ 9/78	02:13	269	12.0	12.6	98.0	13.4		.642E+00	.560E+00	.342E+00
9/ 9/78	02:33	270	12.0	12.6	98.0	14.7		.441E+01	.388E+00	.619E+00
9/ 9/78	02:44	271	12.0	12.4	98.0	14.8		.533E+00	.451E+00	.309E+00
9/ 9/78	13:01	272	12.0	13.3	86.0	6.9		.198E+00	.160E+00	.385E-01
9/ 9/78	13:21	273	12.0	13.0	85.0	7.1		.205E+00	.170E+00	.405E-01
9/ 9/78	13:35	274	12.0	13.3	88.0	7.5		.227E+00	.179E+00	.448E-01
9/ 9/78	14:40	275	12.0	12.1	88.0	6.5		.124E+00	.118E+00	.357E-01
9/ 9/78	15:00	276	12.0	12.2	92.0	5.4		.157E+00	.145E+00	.537E-01
9/ 9/78	15:20	277	12.0	13.3	89.0	8.5		.195E+00	.153E+00	.461E-01

DATE	TIME	FILE	T <sub>s</sub>	Tair	RH	U	N/S	Extinction (Km^-1)
			C	C	Z			3.250
9/ 9/78	15:29	278	42.8	43.7	87.0	8.9	.4880	.1059
9/ 9/78	16:02	280	42.8	43.5	87.0	9.0	.489E+00	.439E-01
9/ 9/78	16:57	281	42.8	42.5	90.0	7.8	.457E+00	.265E-01
9/ 9/78	16:57	282	42.8	42.5	90.0	6.5	.233E+00	.111E+00
9/ 9/78	17:45	283	42.8	42.6	92.0	9.2	.213E+00	.188E+00
9/ 9/78	18:30	284	42.8	42.3	94.0	6.9	.140E+00	.119E+00
9/ 9/78	19:04	285	42.8	42.6	91.0	6.9	.179E+00	.133E+00
9/ 9/78	19:19	287	42.8	42.5	92.0	8.1	.194E+00	.154E+00
9/ 9/78	20:01	288	42.8	42.0	92.0	15.9	.125E+00	.968E-01
9/ 9/78	20:21	289	42.8	42.1	92.0	15.8	.135E+00	.119E+00
9/ 9/78	20:41	290	42.8	42.2	92.0	15.7	.108E+00	.765E-01
9/ 9/78	21:01	291	42.8	42.0	97.0	8.7	.689E-01	.635E-01
9/ 9/78	21:06	292	42.8	42.1	90.0	7.8	.114E+00	.107E+00
9/ 9/78	21:53	293	43.0	42.4	91.0	7.7	.126E+00	.108E+00
9/ 9/78	22:07	294	43.0	42.4	92.0	8.6	.132E+00	.104E+00
9/ 9/78	22:29	295	43.0	42.3	93.0	14.5	.124E+00	.926E-01
9/ 9/78	22:49	296	43.0	42.4	93.0	14.4	.124E+00	.928E-01
9/ 9/78	23:09	297	43.0	42.5	94.0	14.7	.124E+00	.940E-01
9/ 9/78	23:45	298	43.0	42.5	90.0	12.9	.131E+00	.921E-01
9/ 9/78	23:55	299	42.9	42.5	87.0	7.3	.114E+00	.935E-01
9/10/78	00:15	300	43.3	42.6	87.0	7.8	.106E+00	.828E-01
9/10/78	02:04	302	43.3	42.2	94.0	8.9	.167E+00	.149E+00

DATE	TIME	FIL#	T <sub>E</sub> C°	T <sub>AIR</sub> C°	RH %	H/S	4880 nm	Extinction (Km <sup>-1</sup> )
9/10/78	02:17	303	43.3	42.2	92.0	10.1	.400E+00	.782E-01
9/10/78	03:55	304	43.4	42.0	90.0	10.0	.216E+00	.482E+00
9/10/78	04:15	305	43.4	42.3	89.0	9.6	.933E-01	.726E-01
9/10/78	04:19	306	43.4	42.2	89.0	10.4	.834E-01	.702E-01
9/10/78	06:13	307	43.2	42.4	90.0	8.5	.416E+00	.908E-01
9/10/78	06:33	308	43.2	42.3	91.0	9.4	.106E+00	.825E-01
9/10/78	08:17	313	43.2	42.5	87.0	7.4	.698E-01	.599E-01
9/10/78	08:37	314	43.2	42.5	87.0	6.7	.757E-01	.652E-01
9/10/78	11:09	316	43.2	42.5	83.0	5.3	.575E-01	.408E-01
9/10/78	11:29	317	43.2	42.4	84.0	5.6	.606E-01	.456E-01
9/10/78	11:35	318	43.2	42.3	85.0	5.4	.580E-01	.446E-01
9/10/78	13:05	319	43.2	42.2	78.0	4.7	.342E-01	.290E-01
9/10/78	13:25	320	43.2	42.4	77.0	4.5	.277E-01	.245E-01
9/10/78	13:45	321	43.2	42.2	77.0	4.3	.262E-01	.239E-01
9/10/78	16:27	322	43.2	42.1	79.0	6.4	.274E-01	.242E-01
9/10/78	17:45	325	43.2	42.1	87.0	6.2	.502E-01	.476E-01
9/10/78	19:47	326	43.0	41.6	28.0	7.6	.482E+00	.486E+00
9/10/78	20:07	327	43.0	41.6	96.0	11.5	.265E+00	.262E+00
9/10/78	20:27	328	43.0	41.8	97.0	14.3	.191E+00	.190E+00
9/10/78	20:47	329	43.0	42.2	98.0	15.1	.286E+00	.244E+00
9/10/78	21:07	330	43.0	43.0	97.0	8.9	.136E+00	.137E+00
9/10/78	21:27	331	43.0	43.4	97.0	10.4	.203E+00	.145E+00

DATE	TIME	P-TLE	15 °E	15 °W	TOIR °C	KII °C	0 °E	0 °W	Extinction (Km^(-1))
9/10/78	21:47	332	13.0	13.4	96.0	10.6	.305E+00	.202E+00	.557E-04
9/10/78	21:54	333	13.0	13.5	96.0	10.1	.346E+00	.241E+00	.661E-04
9/10/78	00:32	334	13.0	13.4	89.0	12.0	.493E+00	.320E+00	.420E+00
9/10/78	00:52	335	13.0	13.4	89.0	12.4	.492E+00	.312E+00	.422E+04
9/10/78	02:53	336	13.2	12.9	94.0	11.5	.207E+00	.153E+00	.754E-04
9/10/78	03:13	337	13.2	12.9	97.0	10.4	.235E+00	.179E+00	.802E-04
9/10/78	04:54	341	13.2	12.9	93.0	9.2	.224E+00	.186E+00	.901E-04
9/10/78	05:11	342	13.2	12.7	92.0	10.8	.163E+00	.150E+00	.674E-04
9/10/78	05:17	343	13.2	12.6	93.0	10.6	.240E+00	.193E+00	.407E+00
9/10/78	05:39	344	13.2	12.8	94.0	15.4	.281E+00	.223E+00	.413E+00
9/10/78	05:59	345	13.2	12.7	92.0	16.1	.224E+00	.164E+00	.877E-04
9/10/78	06:49	346	13.2	12.8	91.0	16.3	.305E+00	.227E+00	.436E+00
9/10/78	06:39	347	13.2	12.6	94.0	13.3	.467E+00	.339E+00	.235E+00
9/10/78	06:59	348	13.2	12.2	95.0	7.5	.116E+00	.105E+00	.355E-04
9/10/78	07:19	349	13.2	12.1	96.0	6.0	.130E+00	.129E+00	.387E-04
9/10/78	07:59	351	13.2	11.3	97.0	9.7	.659E-04	.681E-04	.448E-04
9/10/78	08:19	352	13.2	11.4	97.0	14.5	.384E-04	.393E-04	.458E-04
9/10/78	08:39	353	13.2	11.0	96.0	12.1	.369E-04	.388E-04	.468E-04
9/10/78	08:59	354	13.2	11.4	95.0	5.9	.323E-04	.341E-04	.438E-04
9/10/78	10:39	359	13.2	11.5	93.0	9.1	.327E-04	.342E-04	.905E-02
9/10/78	11:39	362	13.2	11.5	97.0	2.8	.337E-04	.297E-04	.639E-02
9/10/78	12:19	364	13.2	11.6	97.0	1.8	.479E-04	.507E-04	.441E-01

DATE	TIME	FILE	T <sub>S</sub> °C.	T <sub>air</sub> °C.	RH %	U W/S	Extinction (Km <sup>-1</sup> )	
							4630	3250
9/10/78	13:37	368	13.2	12.4	96.0	12.3	.646E+01	.625E+01
9/10/78	14:21	369	13.2	12.5	95.0	13.4	.448E+00	.154E+00
9/10/78	14:41	370	13.2	12.4	97.0	13.7	.926E+01	.912E+01
9/10/78	15:04	371	13.2	12.3	97.0	14.2	.196E+00	.195E+00
9/10/78	15:24	372	13.2	12.2	93.0	14.9	.192E+00	.187E+00
9/10/78	15:41	373	13.2	12.2	93.0	15.4	.161E+00	.148E+00
9/10/78	16:04	374	13.2	12.5	95.0	13.3	.133E+00	.115E+00
9/10/78	16:24	375	13.2	12.6	92.0	14.2	.123E+00	.994E+01
9/10/78	16:44	376	13.2	12.8	94.0	14.2	.144E+00	.143E+00
9/10/78	17:01	377	13.2	12.8	94.0	13.9	.138E+00	.102E+00
9/10/78	17:14	378	13.2	12.9	94.0	14.7	.230E+00	.198E+00
9/10/78	18:17	379	13.3	12.5	94.0	15.7	.181E+00	.129E+00
9/10/78	18:37	380	13.3	12.5	92.0	16.0	.135E+00	.104E+00

DATE	TIME	FILE	T <sub>E</sub> C.	T <sub>AIR</sub> C.	RH %	U M/S	4880 nm	Extinction (Km <sup>-1</sup> )
9/10/78	16:57	1	13.3	12.5	93.0	15.2	.438E+00	.458E-01
9/10/78	19:17	2	13.3	12.5	90.0	16.0	.124E+00	.426E-01
9/10/78	19:37	3	13.3	12.6	88.0	16.1	.464E+00	.550E-01
9/10/78	19:57	4	13.3	12.4	89.0	16.5	.141E+00	.590E-01
9/10/78	20:17	5	13.3	12.4	87.0	16.6	.469E+00	.806E-01
9/10/78	20:37	6	13.3	12.3	90.0	15.7	.170E+00	.693E-01
9/10/78	20:57	7	13.3	12.2	93.0	16.4	.404E+01	.526E+00
9/10/78	21:15	8	13.4	12.4	94.0	17.4	.303E+00	.126E+00
9/10/78	22:07	9	13.7	12.4	91.0	19.3	.268E+00	.206E+00
9/10/78	22:27	10	13.7	12.3	87.0	18.8	.224E+00	.165E+00
9/10/78	22:47	11	13.7	12.6	85.0	18.3	.258E+00	.192E+00
9/10/78	23:07	12	13.7	12.5	87.0	17.0	.199E+00	.149E+00
9/10/78	23:27	13	13.7	12.4	90.0	16.8	.152E+00	.112E+00
9/10/78	23:47	14	13.7	12.4	94.0	16.8	.175E+00	.126E+00
9/11/78	00:07	15	15.7	12.5	90.0	16.7	.177E+00	.117E+00
9/11/78	00:27	16	13.7	12.6	89.0	16.8	.183E+00	.116E+00
9/11/78	00:47	17	13.7	12.5	87.0	17.2	.172E+00	.107E+00
9/11/78	01:27	19	13.7	12.2	91.0	14.9	.111E+00	.724E-01
9/11/78	03:54	21	13.2	10.9	89.0	17.8	.146E+01	.754E+00
9/11/78	00:05	22	13.2	12.1	77.0	13.6	.473E+00	.131E+00
9/11/78	08:25	23	13.2	12.3	75.0	14.1	.470E+00	.428E+00

DATE	TIME	FILE #	T <sub>S</sub> -C-	T <sub>AIR</sub> -C-	RH %	U M/S	-4880--	Extinction (Km <sup>-1</sup> ) -3.250--	-40.52--
9/11/78	03:45	24	43.2	42.3	72.0	14.2	.152E+00	.120E+00	.798E-01
9/11/78	09:23	25	43.2	42.2	73.0	12.5	.206E+00	.161E+00	.113E+01
9/11/78	09:43	26	43.2	42.0	73.0	13.3	.102E+00	.852E-01	.489E-01
9/11/78	10:03	27	43.2	41.6	76.0	12.9	.441E+00	.115E+00	.769E-01
9/11/78	10:23	28	43.2	41.8	75.0	11.7	.673E-01	.770E-01	.420E-01
9/11/78	10:43	29	43.2	41.9	74.0	42.5	.114E+00	.103E+00	.594E-01
9/11/78	11:03	30	43.2	41.6	75.0	11.5	.140E+00	.114E+00	.757E-01
9/11/78	11:23	31	43.2	41.4	77.0	10.3	.137E+00	.116E+00	.731E-01
9/11/78	11:43	32	43.2	41.9	74.0	10.6	.900E-01	.786E-01	.424E-01
9/11/78	12:03	33	43.2	42.3	70.0	11.0	.799E-01	.706E-01	.347E-01
9/11/78	12:23	34	43.2	42.0	76.0	10.1	.681E-01	.782E-01	.377E-01
9/11/78	12:43	35	43.2	42.0	72.0	10.4	.770E-01	.670E-01	.323E-01
9/11/78	13:03	36	43.2	41.9	73.0	10.9	.592E-01	.527E-01	.243E-01
9/11/78	13:23	37	43.2	41.9	75.0	10.2	.662E-01	.563E-01	.272E-01
9/11/78	13:43	38	43.2	41.8	75.0	9.8	.457E-01	.409E-01	.193E-01
9/11/78	14:03	39	43.2	42.3	70.0	9.3	.433E-01	.438E-01	.169E-01
9/11/78	14:45	40	43.2	42.5	66.0	9.3	.398E-01	.351E-01	.123E-01
9/11/78	14:55	41	43.2	42.6	66.0	9.1	.384E-01	.346E-01	.122E-01
9/11/78	17:58	43	43.2	42.7	61.0	5.9	.473E-01	.418E-01	.124E-01
9/11/78	18:04	44	43.2	42.8	62.0	5.7	.531E-01	.450E-01	.155E-01
9/11/78	19:42	45	43.2	42.3	67.0	5.1	.604E-01	.519E-01	.148E-01
9/11/78	19:54	46	43.5	42.3	68.0	5.0	.624E-01	.523E-01	.167E-01

DATE	TIME	FILE	T <sub>S</sub>	Tair	RH	U	M/S	Extinction (KM <sup>-1</sup> )
		1	C	G	%			3.250
9/11/78	21:43	47	13.4	12.2	70.0	5.3	.566E-04	.476E-04
9/11/78	22:00	48	13.4	12.2	66.0	5.8	.450E-04	.371E-04
9/11/78	22:25	49	13.4	12.2	69.0	5.4	.569E-04	.499E-04
9/12/78	03:46	53	13.7	12.3	70.0	6.2	.564E-04	.453E-04
9/12/78	05:45	61	13.7	14.2	90.0	12.2	.624E-04	.566E-04
9/12/78	07:25	63	13.6	12.0	92.0	13.4	.496E+00	.173E+00
9/12/78	07:45	64	13.7	12.1	92.0	12.6	.302E+00	.256E+00
9/12/78	08:05	65	13.7	12.4	93.0	13.3	.432E+00	.367E+00
9/12/78	08:25	66	13.7	12.4	94.0	14.7	.248E+04	.164E+04
9/12/78	08:45	67	13.7	12.5	94.0	13.8	.170E+04	.134E+04
9/12/78	09:05	68	13.7	12.6	95.0	14.9	.103E+04	.764E+00
9/12/78	12:33	71	13.7	13.7	94.0	11.1	.567E+00	.554E+00
9/12/78	12:48	72	13.7	13.7	94.0	11.1	.647E+00	.620E+00
9/12/78	14:26	73	13.7	13.4	94.0	9.9	.479E+00	.466E+00
9/12/78	14:30	74	13.7	13.4	95.0	9.2	.242E+00	.240E+00
9/12/78	17:33	75	13.7	12.5	92.0	8.6	.184E+00	.174E+00
9/12/78	17:45	76	13.7	12.3	90.0	9.0	.142E+00	.124E+00
9/12/78	20:04	77	13.9	13.3	89.0	10.4	.171E+00	.130E+00
9/12/78	20:09	78	14.0	13.3	88.0	9.5	.169E+00	.120E+00
9/12/78	22:39	79	13.9	13.2	85.0	9.7	.174E+00	.115E+00
9/12/78	22:59	80	13.9	13.3	85.0	9.9	.175E+00	.128E+00
9/13/78	01:07	81	13.9	13.4	87.0	9.2	.208E+00	.166E+00

DATE	TIME	FILE	Ts °C	Tair °C	RH %	U W/S	Extinction (Km^-1)
							-3.750----- -10.52-----
9/13/78	04:25	82	13.9	13.3	89.0	9.5	.217E+00 .476E+00 .640E-04
9/13/78	08:43	87	13.9	13.3	84.0	11.0	.290E+00 .243E+00 .838E-04
9/13/78	09:05	88	13.9	13.3	82.0	16.0	.291E+00 .204E+00 .828E-04
9/13/78	09:23	89	13.9	13.4	83.0	16.0	.363E+00 .237E+00 .101E+00
9/13/78	09:43	90	13.9	13.4	85.0	16.9	.377E+00 .268E+00 .115E+00
9/13/78	10:03	91	13.9	12.9	66.0	19.6	.848E+00 .564E+00 .418E+00
9/13/78	10:23	92	13.9	14.8	70.0	19.7	.191E+00 .131E+00 .613E-04
9/13/78	10:43	93	13.9	13.5	75.0	19.2	.207E+00 .147E+00 .684E-04
9/13/78	14:03	94	13.9	13.9	72.0	18.8	.203E+00 .134E+00 .523E-04
9/13/78	14:23	95	13.9	14.4	69.0	19.1	.220E+00 .155E+00 .625E-04
9/13/78	14:43	96	13.9	14.0	71.0	19.4	.263E+00 .187E+00 .863E-04
9/13/78	14:55	97	13.9	13.8	77.0	19.2	.278E+00 .206E+00 .103E+00
9/13/78	14:23	98	13.9	13.6	77.0	18.3	.246E+00 .167E+00 .682E-04
9/13/78	14:43	99	13.9	13.4	76.0	20.4	.103E+01 .612E+00 .644E+00
9/13/78	14:03	400	13.9	12.4	82.0	17.4	.214E+00 .167E+00 .775E-04
9/13/78	15:23	401	13.9	13.4	80.0	18.2	.266E+00 .189E+00 .948E-04
9/13/78	15:43	402	13.9	13.9	70.0	20.4	.217E+00 .149E+00 .839E-04
9/13/78	14:03	403	13.9	14.0	70.0	18.7	.234E+00 .170E+00 .909E-04
9/13/78	14:23	404	13.9	14.1	63.0	15.2	.213E+00 .148E+00 .809E-04
9/13/78	14:30	405	13.9	14.2	70.0	18.5	.204E+00 .140E+00 .745E-04
9/13/78	15:19	406	13.5	13.7	73.0	21.0	.709E+00 .499E+00 .362E+00
9/13/78	15:39	407	13.5	12.4	84.0	19.7	.602E+00 .435E+00 .317E+00

DATE	TIME	FILE	Y <sub>S</sub>	T <sub>AIR</sub>	RH	U	N/S	4880	Extinction (Km^-1)
9/13/78	45:59	108	13.5	13.3	78.0	20.4	.242E+00	.179E+00	.996E-01
9/13/78	16:05	109	13.5	13.5	72.0	22.0	.178E+00	.113E+00	.504E-01
9/13/78	16:25	110	13.5	13.5	74.0	19.7	.361E+00	.320E+00	.243E+00
9/13/78	16:46	111	13.5	13.9	73.0	14.3	.236E+00	.180E+00	.112E+00
9/13/78	17:08	112	13.5	13.6	75.0	14.0	.226E+00	.165E+00	.886E-01
9/13/78	17:28	113	13.5	13.3	78.0	14.2	.250E+00	.184E+00	.990E-01
9/13/78	17:33	114	13.5	13.2	78.0	14.6	.175E+00	.129E+00	.691E-01
9/13/78	18:38	115	13.5	13.0	79.0	12.8	.247E+00	.194E+00	.117E+00
9/13/78	18:58	116	13.5	13.1	78.0	13.3	.266E+00	.195E+00	.114E+00
9/13/78	19:18	117	13.5	12.9	79.0	13.7	.266E+00	.203E+00	.123E+00
9/13/78	19:38	118	13.5	13.0	76.0	13.4	.242E+00	.180E+00	.106E+00
9/13/78	19:58	119	13.5	13.0	78.0	13.5	.239E+00	.178E+00	.103E+00
9/13/78	20:18	120	13.5	12.9	79.0	13.3	.262E+00	.192E+00	.111E+00
9/13/78	20:38	121	13.6	13.0	77.0	13.7	.230E+00	.163E+00	.973E-01
9/13/78	20:58	122	13.7	13.1	77.0	13.3	.229E+00	.165E+00	.951E-01
9/13/78	21:18	123	13.7	13.0	79.0	14.3	.256E+00	.185E+00	.113E+00
9/13/78	21:38	124	13.7	13.0	77.6	13.7	.232E+00	.171E+00	.102E+00
9/13/78	22:15	125	13.7	13.1	76.0	14.4	.242E+00	.169E+00	.104E+00
9/13/78	22:35	126	13.7	13.1	78.0	13.9	.241E+00	.169E+00	.989E-01
9/13/78	23:15	128	13.7	13.1	77.0	14.4	.241E+00	.157E+00	.881E-01
9/13/78	23:27	129	13.7	13.0	78.0	15.0	.547E+00	.150E+00	.845E-01
									.354E+00

DATE	TIME	FILE	V <sub>s</sub>	Vair	RH	U	M/S	Extinction (km^-1)
9/14/78	11:04	436	13.6	11.0	71.0	12.5	.891E-01	.542E-01
9/14/78	11:24	437	13.6	12.4	68.0	10.9	.166E+00	.128E+00
9/14/78	14:04	445	13.6	12.6	66.0	11.0	.905E-01	.661E-01
9/14/78	01:49	453	12.5	12.8	95.0	23.6	.233E+01	.163E+01
9/14/78	02:07	454	12.5	12.5	96.0	23.9	.391E+01	.320E+01
9/14/78	13:59	478	13.5	13.3	67.0	13.4	.535E-01	.341E-01
9/14/78	14:19	479	13.5	13.2	74.0	17.4	.857E-01	.599E-01
9/14/78	14:39	480	13.5	13.2	84.0	16.3	.136E+00	.999E-01
9/14/78	14:59	481	13.5	13.3	61.0	16.4	.131E+00	.714E-01
9/14/78	15:19	482	13.5	13.3	84.0	16.8	.179E+00	.855E-01
9/14/78	15:27	483	13.5	13.5	77.0	17.3	.167E+00	.715E-01
9/14/78	19:13	484	13.5	13.2	86.0	15.0	.159E+00	.118E+00
9/14/78	19:33	485	13.5	13.3	87.0	14.6	.163E+00	.128E+00
9/14/78	19:53	486	13.5	13.8	87.0	15.3	.742E-01	.450E-01
9/14/78	20:09	487	13.5	14.2	88.0	14.9	.367E-01	.238E-01

APPENDIX B

Meteorological and Aerosol Extinction  
Data from CEWCOM-78. The Time is PDT.

DATE	TIME	LINE ---	T <sub>6</sub> ---	T <sub>6</sub> ---	T <sub>6</sub> ---	RH ---	U ---	A <sub>650</sub> ---	Extinction (Km <sup>-1</sup> ) ---
5/14/78	18:10	3	16.0	17.6	31.7	7.0	.117E+00	.737E-01	.476E-01
5/14/78	19:39	2	16.0	19.6	31.7	7.0	.117E+00	.750E-01	.436E-01
5/14/78	20:50	3	16.0	19.6	31.7	7.0	.106E+00	.651E-01	.340E-01
5/14/78	19:10	4	15.0	19.6	31.7	7.0	.113E+00	.679E-01	.439E-01
5/14/78	19:36	5	16.0	19.6	31.7	7.0	.140E+00	.694E-01	.427E-01
5/14/78	19:50	6	14.0	14.6	83.4	5.0	.107E+00	.586E-01	.893E-02
5/14/78	20:10	7	14.0	14.2	83.4	5.0	.745E-01	.462E-01	.727E-02
5/14/78	20:30	8	14.0	14.2	83.4	5.0	.926E-01	.412E-01	.536E-02
5/14/78	20:50	9	14.3	14.5	85.4	7.3	.104E+00	.494E-01	.306E-01
5/14/78	21:10	10	14.3	14.5	85.4	7.3	.919E-01	.346E-01	.471E-02
5/14/78	21:30	11	14.3	14.5	85.4	7.3	.762E-01	.397E-01	.501E-02
5/14/78	21:50	12	14.6	14.9	82.5	8.0	.374E-01	.328E-01	.145E-01
5/14/78	22:10	13	14.6	14.9	82.5	8.0	.890E-01	.342E-01	.451E-02
5/14/78	22:30	14	14.6	14.9	82.5	8.0	.755E-01	.254L-01	.514E-02
5/14/78	22:50	27	15.5	15.7	87.7	2.2	.122E+00	.804E-01	.146E-01
5/14/78	03:10	28	15.5	15.3	97.7	2.2	.122E+00	.751E-01	.137E-01
5/14/78	03:30	29	15.5	15.3	87.7	2.2	.105E+00	.663E-01	.125E-01
5/14/78	03:50	30	17.0	16.6	79.9	1.7	.797E-01	.444E-01	.875E-02
5/14/78	04:10	31	17.0	16.0	79.9	1.7	.954E-01	.566E-01	.117E-01
5/14/78	04:30	32	17.0	16.0	79.9	1.7	.102E+00	.643E-01	.124E-01
5/14/78	08:44	33	17.6	17.0	82.5	4.5	.944E-01	.333E-01	.850E-02

DATE	Filter	Filter	T <sub>s</sub>	Vair	RH	U	M <sub>23</sub>	Extinction (Km^-1)
			C <sub>1</sub>	C <sub>2</sub>	Z <sub>1</sub>	Z <sub>2</sub>		3.250
								-3.250
5/12/78	09:04	34	17.6	17.0	82.5	4.5	.419E+00	.317E-04
5/12/78	07:24	35	17.6	17.0	82.5	4.5	.104E+00	.260E-04
5/12/78	07:44	36	18.2	17.4	82.9	3	.412E+00	.344E-04
5/12/78	10:04	37	18.2	17.3	82.9	3	.425E+00	.296E-04
5/12/78	10:24	38	18.2	17.1	82.9	3	.444E+00	.334E-04
5/12/78	10:44	39	17.8	17.5	82.5	4.4	.437E+00	.301E-04
5/12/78	11:04	40	17.8	17.5	82.5	4.3	.428E+00	.200E-04
5/12/78	11:24	41	17.8	17.5	82.5	4.3	.126E+00	.238E-04
5/12/78	11:44	42	17.9	18.0	82.3	2.2	.198E+00	.402E-04
5/12/78	12:04	43	17.9	18.0	82.3	2.2	.149E+00	.402E-04
5/12/78	12:24	44	18.0	17.3	82.0	5.9	.186E+00	.345E-04
5/12/78	12:44	45	18.6	18.9	77.4	2.6	.157E+00	.275E-04
5/12/78	13:04	46	18.6	18.9	77.4	2.6	.145E+00	.277E-04
5/12/78	13:24	47	18.6	18.9	77.4	2.6	.149E+00	.270E-04
5/12/78	13:44	48	18.0	18.1	83.0	4.4	.149L+00	.247E-04
5/12/78	14:04	49	18.2	18.3	82.7	4.6	.173E+00	.219E-04
5/12/78	14:24	50	18.2	18.3	82.7	4.8	.166E+00	.218E-04
5/12/78	14:44	51	18.6	18.9	80.8	4.4	.150E+00	.205E-04
5/12/78	15:24	53	18.5	18.4	77.5	5.5	.165E+00	.255E-04
5/12/78	15:44	54	18.5	18.4	77.5	5.5	.134E+00	.224E-04
5/12/78	16:04	55	18.5	18.4	77.5	6.6	.105E+00	.152E-04

DATE	TIME	F.F.E	T <sub>s</sub> C <sub>o</sub>	Tair C <sub>o</sub>	RH %	U N/S	Extinction (Km^-1)
5/12/78	12:44	60	19.1	18.4	84.7	.5	.469E+00 .3250 .4059
5/12/78	13:04	64	19.1	18.4	84.7	.5	.450E+00 .264E-01 .501E-02
5/12/78	13:24	62	19.2	18.2	84.8	.5	.443E+00 .295E-01 .542E-02
5/12/78	13:44	63	19.2	18.2	84.3	.2,9	.437E+00 .485E-01 .610E-02
5/12/78	13:45	63	19.2	18.2	84.3	.2,9	.437E+00 .485E-01 .992E-02
5/12/78	19:05	64	13.0	13.2	95.0	.3,7	.434E+00 .397E-01 .762E-02
5/12/78	19:25	65	13.5	13.0	97.2	.3,6	.440E+00 .395E-01 .850E-02
5/12/78	19:45	66	18.5	18.0	87.2	.3,6	.420E+00 .394E-01 .884E-02
5/12/78	20:05	67	19.0	17.7	90.0	.3,7	.433E+00 .487E-01 .947E-02
5/12/78	20:25	68	18.7	17.9	90.0	.5,4	.427E+00 .544E-01 .959E-02
5/12/78	20:45	69	18.7	17.9	90.0	.5,4	.443E+00 .452E-01 .939E-02
5/12/78	21:05	70	18.5	18.7	92.3	.3,3	.403E+00 .360E-01 .645E-02
5/12/78	21:45	71	18.5	18.7	92.3	.3,3	.498E-01 .288E-01 .579E-02
5/12/78	22:05	73	16.4	16.7	92.3	.3,3	.879E-01 .301E-01 .593E-02
5/12/78	22:45	75	16.4	16.7	88.7	.2,3	.700E-01 .308E-01 .617E-02
5/12/78	23:05	76	17.6	18.4	84.4	.4	.653E-01 .257E-01 .528E-02
5/12/78	23:25	77	17.6	18.4	84.4	.4	.704E-01 .290E-01 .625E-02
5/12/78	23:45	78	17.9	18.4	88.4	.4	.699E-01 .224E-01 .427E-02
5/13/78	00:05	79	17.9	18.4	88.4	.3,0	.812E-01 .286E-01 .569E-02
5/13/78	00:25	80	17.9	18.4	88.4	.3,0	.422E+00 .437E-01 .955E-02
5/14/78	00:45	—	—	—	—	—	.30E+00 .30E+00 .875E-02

DATE	TIME	FILE	T <sub>g</sub> [C]	Vair [cm <sup>-1</sup> ]	RH [%]	U [V]	Extinction (Km <sup>-1</sup> )
5/13/73	04:05	02	17.3	17.4	95.6	4.5	.423E+00 .372E-01 .570E-02
5/13/73	04:25	03	17.3	17.4	95.6	4.5	.137E+00 .382E-01 .704E-02
5/13/73	04:45	04	17.0	17.1	95.4	3.6	.993E-01 .404E-01 .653E-02
5/13/73	05:05	05	17.0	17.4	95.4	3.6	.945E-01 .430E-01 .595E-02
5/13/73	05:25	06	16.0	17.4	87.4	3.6	.779E-01 .471E-01 .724E-02
5/13/73	05:45	07	17.7	16.6	86.7	2.2	.403E+00 .523E-01 .782E-02
5/13/73	06:05	08	17.7	16.8	86.7	2.2	.920E-01 .509E-01 .806E-02
5/13/73	06:25	09	17.7	16.8	86.7	2.2	.986E-01 .526E-01 .755E-02
5/13/73	06:45	00	17.6	16.4	87.4	4.7	.977E-01 .562E-01 .935E-02
5/13/73	07:05	01	17.6	16.4	87.4	4.7	.563E-01 .649E-01 .842E-02
5/13/73	07:25	02	17.7	16.8	86.7	2.2	.442E+00 .619E-01 .440E-01
5/13/73	07:45	03	17.6	16.4	87.4	4.7	.117E+00 .842E-01 .158E-01
5/13/73	08:05	04	17.6	16.4	87.4	4.7	.145E+00 .953E-01 .154E-01
5/13/73	08:25	05	17.6	16.4	87.4	4.7	.472E+00 .105E+00 .165E-01
5/13/73	08:45	06	17.6	16.4	87.4	2.2	.194E+00 .950E-01 .144E-01
5/13/73	09:05	07	14.0	14.0	94.2	2.2	.167E+00 .944E-01 .144E-01
5/13/73	09:25	08	14.0	14.0	94.2	2.2	.194E+00 .944E-01 .144E-01
5/13/73	09:45	09	13.6	13.6	96.5	0.8	.433E+00 .842E-01 .133E-01
5/13/73	10:05	09	13.6	14.1	96.5	0.8	.433E+00 .842E-01 .133E-01
5/13/73	10:25	09	13.6	14.1	95.5	0.8	.434E+00 .842E-01 .133E-01
5/13/73	10:45	09	14.0	14.0	94.9	0.8	.452E+00 .944E-01 .144E-01
5/13/73	11:05	10	14.3	14.3	94.6	0.8	.434E+00 .842E-01 .133E-01
5/13/73	11:25	10	14.3	14.3	94.6	0.8	.153E+00 .406E+00 .465E-01
5/13/73	11:45	10	14.3	14.3	94.6	0.8	.177E+00 .441E+00 .474E-01
5/13/73	12:05	10	14.3	14.3	94.6	0.8	.167E+00 .406E+00 .464E-01
5/13/73	12:25	10	14.3	14.3	94.6	0.8	.177E+00 .441E+00 .474E-01
5/13/73	12:45	10	14.3	14.3	94.6	0.8	.167E+00 .406E+00 .464E-01
5/13/73	13:05	10	14.3	14.3	94.6	0.8	.177E+00 .441E+00 .474E-01

B-5

DATE	LST	P-TLE - E	T <sub>E</sub> - F	Tair - S.	RH - %	U M/S	Amb 0 - -	Extinction (km^-1) - 2.750
5/13/78	06:25	104	14.3	14.6	93.0	.3	.165E+00	.157E-04
5/13/78	17:06	105	14.7	15.2	93.4	.1	.137E+00	.922E-02
5/13/78	18:26	106	14.2	16.4	89.6	.2	.124E+00	.109E-01
5/13/78	19:46	107	14.2	16.4	89.1	.2	.120E+00	.104E-01
5/13/78	20:06	108	14.2	16.4	89.1	.2	.139E+00	.144E-01
5/13/78	20:26	109	14.9	16.2	93.3	.0	.133E+00	.101E-01
5/13/78	20:46	110	14.9	16.2	93.3	.0	.157E+00	.931E-01
5/13/78	21:06	111	14.9	16.2	93.3	.0	.1234E+00	.147E+06
5/13/78	21:26	112	14.9	16.2	93.3	.0	.244E+00	.171E+00
5/13/78	21:46	113	14.9	16.2	93.3	.0	.317E+00	.239E+00
5/13/78	23:46	114	14.7	15.3	94.9	.2	.230E+00	.255E-01
5/14/78	09:06	145	14.4	13.6	99.9	.6	.335E+01	.215E+01
5/14/78	09:26	146	14.7	14.3	100.0	.0	.520E+00	.430E+00
5/14/78	09:46	147	14.3	13.6	99.9	.0	.335E+01	.300E+04
5/14/78	10:06	148	14.7	14.0	99.9	.2	.132E+01	.991E+00
5/14/78	10:26	149	14.6	14.4	97.3	.0	.137E+01	.436E+01
5/14/78	10:46	150	14.6	13.7	95.3	.9	.172E+00	.322E-04
5/14/78	11:26	151	14.6	13.7	95.3	.9	.240E+01	.183E+01
5/14/78	10:46	152	14.8	14.3	94.4	.9	.400E+00	.761E-04
5/14/78	14:46	153	15.2	13.6	93.4	.8	.460E+00	.108E+00
5/14/78	12:26	157	15.1	13.8	93.3	.3	.224E+00	.542E-04
5/14/78	12:46	158	15.1	13.8	93.3	.3	.235E+01	.120E-01

DATE	TIME	FILE #	T <sub>S</sub> °C.	T <sub>AIR</sub> °C.	RH %	U W/S	-4990--	-3250--	Extinction (Km <sup>-1</sup> ) -3250--
5/14/78	13:06	159	15.2	14.0	94.3	4.8	.221E+00	.383E-01	.769E-02
5/14/78	13:26	160	15.2	14.2	94.0	2.0	.227E+00	.320E-01	.697E-02
5/14/78	14:06	161	15.0	14.5	94.2	2.2	.178E+00	.264E-01	.500E-02
5/14/78	14:26	163	15.0	14.0	90.1	4.3	.163E+00	.210E-01	.441E-02
5/14/78	15:06	165	14.8	14.0	92.4	3.6	.6681E+0.9	.706E+0.0	.990E+0.0
5/14/78	15:26	166	15.1	14.6	91.2	2.0	.139E+0.0	.190E-0.4	.368E-0.2
5/14/78	15:46	167	15.1	14.6	94.2	2.0	.148E+0.0	.167E-0.1	.312E-0.2
5/14/78	16:06	168	15.3	15.3	86.2	2.3	.926E-0.1	.152E-0.1	.347E-0.2
5/14/78	16:26	169	15.0	15.7	86.3	2.6	.146E+0.0	.274E-0.1	.615E-0.2
5/14/78	16:46	170	15.0	15.7	86.3	2.6	.144E+0.0	.305E-0.1	.524E-0.2
5/14/78	17:26	172	14.9	15.4	88.5	2.6	.226E+0.0	.632E-0.1	.133E-0.1
5/14/78	17:46	173	14.9	15.4	88.5	2.6	.171E+0.0	.670E-0.1	.145E-0.1
5/14/78	18:06	174	14.9	15.5	89.3	2.3	.156E+0.0	.709L-0.1	.143E-0.1
5/14/78	18:26	175	14.7	15.1	87.5	2.7	.173E+0.0	.729E-0.1	.151E-0.1
5/14/78	19:06	176	14.5	14.5	88.7	4.3	.562E-0.1	.360E-0.1	.759E-0.2
5/14/78	19:46	177	14.5	14.3	88.7	4.3	.611E-0.1	.429E-0.1	.948E-0.2
5/14/78	20:26	178	14.6	14.2	90.5	4.1	.588E-0.1	.412E-0.1	.806E-0.2
5/14/78	20:46	179	14.3	14.3	88.7	4.3	.606E-0.1	.434E-0.1	.654E-0.2
5/14/78	21:26	180	14.4	14.4	87.8	4.2	.577E-0.1	.383E-0.1	.699E-0.2
5/14/78	21:46	181	14.2	14.2	89.4	4.4	.606E-0.1	.411E-0.1	.786E-0.2
5/14/78	22:26	182	14.1	14.1	88.8	4.5	.600E-0.1	.434E-0.1	.152E-0.1
5/14/78	22:46	183	14.2	14.4	88.8	7.7	.705E-0.1	.536E-0.1	.484E-0.1
5/14/78	23:06	184	14.1	14.4	87.0	7.6	.694E-0.1	.484E-0.1	.426E-0.1

DATE	TIME	FILE #	T <sub>b</sub> K	V <sub>air</sub> C	RH %	0 MHz	Extinction (km^-1)
5/15/78	00:06	192	14.1	14.2	87.4	7.0	.4990 . . . . .
5/15/78	00:20	193	14.1	14.2	87.4	7.0	.560E-01 . . . . .
5/15/78	00:46	212	14.6	14.7	78.9	10.3	.663E-01 . . . . .
5/15/78	07:26	214	14.6	14.5	78.4	9.9	.540E-01 . . . . .
5/15/78	07:46	215	14.6	14.7	78.3	8.9	.567E-01 . . . . .
5/15/78	09:26	217	14.7	14.7	63.4	9.8	.564E-01 . . . . .
5/15/78	08:46	218	14.7	14.7	63.4	9.8	.546E-01 . . . . .
5/15/78	09:06	219	14.6	14.7	63.5	10.4	.574E-01 . . . . .
5/15/78	09:26	220	14.6	13.9	63.6	11.3	.606E-01 . . . . .
5/15/78	10:06	222	14.6	14.4	85.3	11.0	.765E-01 . . . . .
5/15/78	11:06	225	14.6	14.3	84.3	10.2	.764E-01 . . . . .
5/15/78	11:26	226	14.6	14.3	84.3	10.2	.713E-01 . . . . .
5/15/78	14:46	227	15.0	14.3	80.4	11.5	.115E+00 . . . . .
5/15/78	12:06	228	15.2	14.3	80.2	11.0	.739E-01 . . . . .
5/15/78	12:26	229	15.2	14.3	80.2	11.0	.662E-01 . . . . .
5/15/78	13:46	233	15.5	14.4	82.7	11.7	.427E-01 . . . . .
5/15/78	14:46	236	15.7	14.6	78.0	12.3	.417E+00 . . . . .
5/15/78	15:26	238	15.8	14.7	70.6	13.0	.105E+00 . . . . .
5/15/78	15:46	239	15.7	14.9	67.5	13.3	.106E+00 . . . . .
5/15/78	16:26	241	15.7	14.8	67.5	14.3	.112E+00 . . . . .
			15.7	14.7	71.4	14.1	.57E6.00 . . . . .
							.764E+04 . . . . .
							.349E-01 . . . . .

DATE	TIME	FILE	$\frac{V}{R}$	$\frac{V}{I}$	RH $\frac{\%}{20}$	0 $\frac{\%}{5}$	$\frac{-43300}{-25000}$	Extinction (Km $^{-1}$ ) $\frac{3.25000}{-2.25000}$
5/15/78	17:26	234	35.7	31.6	63.6	14.3	3.271100	.005E+01 .970E-04
5/15/78	18:46	2403	46.9	44.3	62.6	15.4	4.61E+00	.422E+00 .746E-04
5/15/78	19:26	2350	44.8	43.9	55.7	16.3	4.46E+00	.400E+00 .504E-04
5/16/78	17:23	3227	47.2	45.4	72.5	6.3	4.20E+00	.503E+01 .149E-04
5/18/78	17:28	3243	47.7	46.1	77.5	6.3	4.37E+00	.535E+01 .129E-04
5/18/78	17:53	3229	46.9	45.7	79.9	5.2	4.48E+00	.504E+01 .934E-02
5/18/78	18:13	330	15.9	15.5	81.7	5.5	4.20E+00	.548E+01 .100E-04
5/18/78	18:53	332	46.3	45.4	82.2	4.9	4.27E+00	.514E+01 .882E-02
5/18/78	19:13	333	46.3	45.4	82.2	4.9	4.34E+00	.604E+01 .958E-02
5/18/78	19:53	335	16.0	14.9	87.7	5.6	4.54E+00	.933E+01 .336E-04
5/18/78	20:13	336	45.9	44.4	90.5	2.9	4.52E+00	.799E+01 .465E-04
5/18/78	20:53	338	45.3	44.0	93.5	2.9	4.63E+00	.863E+01 .150E-04
5/18/78	21:13	339	45.3	44.3	93.5	2.5	4.71E+00	.860E+01 .141E-04
5/18/78	22:43	342	45.4	44.9	98.0	7.7	2.03E+00	.108E+00 .173E-04
5/19/78	10:50	364	45.4	44.8	98.0	7.7	4.53E+00	.259E+01 .109E-04
5/19/78	11:50	367	45.2	42.1	95.2	4.7	1.90E+00	.253E+01 .409E-04
5/19/78	12:10	368	45.2	42.1	95.2	4.7	2.64E+00	.294E+01 .638E-02
5/19/78	12:30	369	45.3	42.2	94.6	4.9	2.29E+00	.308E+01 .977E-02
5/19/78	12:40	370	45.3	42.3	93.6	5.3	2.27E+00	.332E+01 .444E-04
5/19/78	13:56	372	45.4	42.4	93.1	5.2	4.43E+00	.555E+01 .160E-04
5/19/78	13:56	373	45.5	42.5	93.0	5.2	4.62E+00	.579E+01 .163E-04
5/19/78	44:10	374	45.5	42.6	93.0	5.2	4.03E+00	.568E+01 .434E-04

DATE	TIME	JUL	V <sub>R</sub>	V <sub>AIR</sub>	KH	U	Extinction (Km^-1)
			m/s	m/s	%	m/s	
5/19/78	13:30	375	105.5	12.7	93.0	5.2	.521E+00 .527E+04
5/19/78	13:50	376	105.5	12.7	92.6	5.4	.310E+00 .549E+04
5/19/78	14:19	377	105.5	12.7	92.6	5.4	.302E+00 .549E+04
5/19/78	14:30	378	105.5	12.6	92.7	5.5	.302E+00 .549E+04
5/19/78	14:50	379	105.6	12.6	93.2	5.7	.302E+00 .549E+04
5/19/78	15:10	380	105.6	12.6	93.2	5.7	.302E+00 .549E+04

DATE	TIME	FILE	T <sub>S</sub> °C	T <sub>AIR</sub> °C	RH %	U W/S	Extinction (Km^-1)
5/19/78	15:30	4	45.5	42.5	94.1	6.6	.402E+00 .7250
5/19/78	15:50	2	45.4	42.4	93.9	7.3	.469E+00 .426E+00
5/19/78	17:05	3	45.4	42.4	93.9	7.6	.386E+00 .910E+01
5/19/78	20:05	5	45.3	41.3	97.2	7.6	.779E+00 .296E+01
5/19/78	20:25	0	45.4	41.4	97.8	7.8	.620E+00 .444E+00
5/19/78	20:30	7	45.4	41.4	97.8	7.8	.345E+00 .187E+00
5/19/78	21:00	6	45.3	42.0	90.5	8.1	.110E+00 .449E+00
5/20/78	14:20	9	44.7	42.0	89.4	7.4	.108E+00 .404E+01
5/20/78	14:40	10	44.7	42.0	89.4	7.4	.128E+00 .428E+01
5/20/78	12:00	11	44.6	42.1	88.7	7.7	.944E+01 .455E+01
5/20/78	12:20	12	44.5	42.4	87.0	7.7	.937E+01 .440E+01
5/20/78	12:40	13	44.5	42.4	87.0	7.7	.914E+01 .428E+02
5/20/78	13:00	14	44.4	42.3	90.4	8.1	.937E+01 .426E+01
5/20/78	13:20	15	43.6	42.4	84.4	8.3	.902E+01 .454E+01
5/20/78	13:40	16	43.6	42.4	84.4	8.3	.853E+01 .454E+01
5/20/78	14:00	17	44.2	42.7	82.9	7.9	.747E+01 .347E+01
5/20/78	15:00	20	44.3	42.6	81.2	8.3	.722E+01 .257E+01
5/20/78	15:20	21	44.4	42.9	80.7	8.3	.646E+01 .274E+01
5/20/78	15:40	22	44.4	42.9	80.7	8.3	.638E+01 .243E+01
5/20/78	16:00	23	44.4	42.9	80.5	8.3	.705E+01 .223E+01

DATE	TIME	FILE #	T <sub>S</sub> C	T <sub>air</sub> C	RH %	U M/S	Extinction (km^-1)
5/20/78	16:20	24	14.4	12.8	81.4	8.1	.747E-01 .339E-01 .744E-02
5/20/78	16:40	25	14.4	12.8	81.4	8.1	.791E-01 .395E-01 .104E-01
5/20/78	17:00	26	14.4	12.6	82.7	8.9	.740E-01 .334E-01 .915E-02
5/20/78	17:20	27	14.5	12.5	82.4	9.0	.703E-01 .323E-01 .763E-02
5/20/78	17:40	28	14.5	12.5	82.4	9.0	.667E-01 .474E-01 .427E-04
5/20/78	18:00	29	14.5	12.5	83.4	9.4	.829E-01 .446E-01 .455E-04
5/20/78	18:20	30	14.6	12.3	83.5	10.3	.830E-01 .438E-01 .459E-04
5/20/78	18:40	31	14.6	12.3	83.5	10.3	.795E-01 .434E-01 .445E-04
5/20/78	19:00	32	14.5	12.2	84.3	10.3	.823E-01 .462E-01 .458E-04
5/20/78	20:00	35	14.4	12.2	87.0	9.0	.403E+00 .601E-01 .481E-04
5/20/78	20:20	36	13.8	12.1	86.7	10.2	.942E-01 .538E-01 .478E-04
5/20/78	20:40	37	13.8	12.1	86.7	10.2	.940E-01 .551E-01 .469E-04
5/20/78	21:00	38	13.7	12.2	87.6	10.0	.930E-01 .532E-01 .479E-04
5/20/78	21:20	39	13.4	12.2	87.7	10.1	.938E-01 .529E-01 .444E-04
5/20/78	21:40	40	13.4	12.2	87.7	10.1	.893E-01 .508E-01 .442E-04
5/20/78	22:00	41	13.2	12.1	87.3	9.7	.969E-01 .498E-01 .462E-04
5/20/78	22:20	42	13.0	12.2	87.7	9.4	.895E-01 .492E-01 .439E-04
5/20/78	22:40	43	13.0	12.2	87.7	9.4	.934E-01 .554E-01 .478E-04
5/20/78	23:00	44	13.0	12.1	87.4	9.0	.923E-01 .535E-01 .499E-04
5/20/78	23:20	45	13.1	12.0	87.9	9.3	.952E-01 .574E-01 .482E-04
5/20/78	23:40	46	13.1	12.0	87.9	9.3	.820E-01 .430E-01 .443E-04
5/21/78	0:00	47	13.0	11.9	87.6	9.6	.795E-01 .473E-01 .450E-04

Date	Unit	FILE	Ts	Tair	RH	U	Extinction (Km^-1)
			deg.	deg.	%	m	
5/21/78	04:00	51	33.1	12.0	83.3	9.2	.926E-01
5/21/78	04:40	52	33.1	12.0	83.3	9.2	.821E-01
5/21/78	05:00	53	33.0	13.9	82.4	8.8	.357E-01
5/21/78	05:40	54	33.0	13.9	82.4	8.8	.498E-01
5/21/78	06:00	55	33.1	13.9	82.0	8.4	.526E-01
5/21/78	06:40	56	33.0	13.9	83.7	8.2	.734E-01
5/21/78	07:00	57	33.0	13.9	83.7	8.2	.373E-01
5/21/78	07:40	58	33.0	13.9	83.7	8.2	.323E-01
5/21/78	08:00	59	33.0	14.9	83.9	8.4	.639E-01
5/21/78	08:40	60	33.0	14.9	82.7	8.7	.655E-01
5/21/78	09:00	61	33.0	14.9	82.7	8.7	.598E-01
5/21/78	09:40	62	-3.0	12.0	81.2	8.7	.563E-01
5/21/78	10:00	63	13.1	12.1	81.4	7.9	.630E-01
5/21/78	10:40	64	13.1	12.1	81.4	7.9	.560E-01
5/21/78	11:00	65	13.0	12.2	80.0	8.2	.597E-01
5/21/78	11:20	66	13.1	12.3	79.5	7.7	.539E-01
5/21/78	11:40	67	13.1	12.3	79.5	7.7	.554E-01
5/21/78	12:00	68	13.1	12.4	79.8	6.8	.547E-01

## BIBLIOGRAPHY

1. Fairall, C. W., G. E. Schacher, and K. L. Davidson (1980): "Atmospheric Optical Comparisons During MAGAT-80", Technical Report NPS-61-81-002.
2. Fitzgerald, J. W. and R. E. Ruskin (1976): "A Marine Aerosol Model for the North Atlantic", Technical Report NR2.
3. Houlihan, T. M., K. L. Davidson, C. W. Fairall, and G. E. Schacher (1978): "Experimental Aspects of a Shipboard System Used in Investigation of Overwater Turbulence and Profile Relationships", Technical Report NPS-61-78-007.
4. Hughes, H. G. (1980): "Aerosol Extinction Coefficient Variations With Altitude at 3.75 um in a Coastal Marine Environment", *J. Appl. Met.*, 19, 803-808.
5. Katz, Barry (1980): Private Communication
6. Larson, R. E., W. Kasemir, and D. J. Bressan (1979): "Measurements of Atmospheric <sup>222</sup>Rn at San Nicholas Island and Over Nearby California Coastal Areas During CEWCON-78", Technical Report NRL #3941.
7. Noonkester, V. Ray (1980): "Offshore Aerosol Spectra and Humidity Relations Near Southern California", Proceedings Second Conference on Coastal Meteorology, AMS, Boston, Massachusetts, 113-120.
8. Schacher, G. E., K. L. Davidson, and C. W. Fairall (1980): "Optical Aerosol Spectrometers? Factors Affecting Optical Extinction Predictions", Technical Report NPS-61-80-013.

## BIBLIOGRAPHY (continued)

9. Wells, W. C., G. Gal, and M. W. Munn (1977): "Aerosol Distributions in Maritime Air and Predicted Scattering Coefficients in the Infrared", *Applied Optics*, 16, 654-659.

INITIAL DISTRIBUTION LIST

	<u>DODAACD Code</u>	<u>No. of Copies</u>
1. Defense Documentation Center Cameron Station, Building 5 Alexandria, VA 22314	S47031	12
2. Library, Code 0212 Naval Postgraduate School Monterey, CA 93940		2
3. Dean of Research, Code 012 Naval Postgraduate School Monterey, CA 93940	N62271	1
4. C. W. Fairall, The BDM Corporation Naval Postgraduate School Monterey, CA 93940		10
5. Director, Naval Research Laboratory ATTN: Code 2627 Washington, D.C. 20375	N00173	6
6. Office of Naval Research Branch Office 1030 East Green Street Pasadena, CA 91106	N62879	1
7. Assoc. Professor K. L. Davidson, Code 63Ds Naval Postgraduate School Monterey, CA 93940		2
8. Professor G. E. Schacher, Code 61Sq Naval Postgraduate School Monterey, CA 93940		2
9. Mr. Robin Simpson Administrative Contracting Officer Office of Naval Research Resident Representation Stanford University, Room 165 Durond Aeronautics Bldg. Stanford, CA 94305		1